

THE IRON AGE

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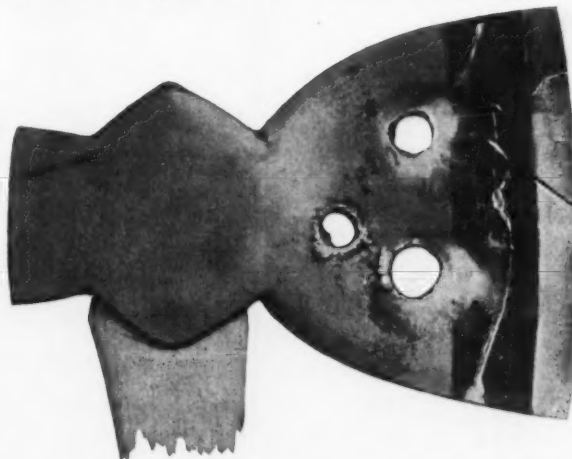
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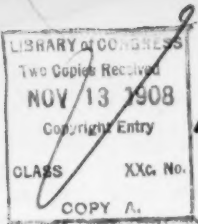
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THE IRON AGE

New York, Thursday, November 12, 1908.

Vanadium and Its Estimation.

BY GEORGE AUCHY, PHILADELPHIA.

One of the most interesting questions of the iron trade at the present time is whether or not vanadium is all that it is claimed to be. The property of nickel, chromium and tungsten (and manganese, also, according to Dr. Guillet, who stoutly maintains that so long as the steel is pearlitic—that is, under 3 per cent. manganese in an 0.80 carbon steel—there is no brittleness), of giving to the pearlitic steels containing them the same qualities as carbon, without lessening the resistance to shock as carbon does, has been known and utilized for many years. Now, is the new arrival and rival, vanadium, as much better than nickel and chromium as we are disposed to think it is?

Poverty of Proof and Wealth of Assertion.

The claim that it is so much superior, coming as it does from all quarters, and with so much confidence and emphasis, is one that it would be hardihood to question or dispute, and the writer does not propose to do so, and, moreover, is not competent to form an opinion one way or the other, but there is one thing that is clear, and it is that to which he briefly wishes to call attention, namely, the astonishing poverty of proof as compared with the exuberant wealth of assertion in this matter. It is true that J. Kent Smith, in the *Transactions* of the American Institute of Mining Engineers for 1907, gives a very remarkable instance of the immense superiority of vanadium steel over ordinary steel in resistance to shock, but a single instance is hardly convincing. The superiority might be accidental and due to something else. Going clear back to the beginning for further evidence, we find another instance, quoted by Dr. Guillet, when the preliminary tests at the Firminy Steel Works, France, gave the following:

	Tensile. Kilos.	Elastic. Kilos.	Elongation. Per cent.
Without vanadium.....	87.6	75.5	10
With vanadium.....	115.2	109.5	11.3

And the latter hardened far more by quenching.

Here is another remarkable case, and if this and Mr. Smith's instance, previously quoted, were all that we had, we would probably be satisfied that vanadium is better than nickel or chromium, but when we come next to Professor Arnold's first tests and find that in a high carbon steel an increase of vanadium from 0.14 to 0.77 per cent. raises the tensile strength only from 106.6 to 121 (without it is true lessening the elongation), we begin to feel uncertain again, for obviously nickel or chromium could accomplish this much. Another test by Professor Arnold, this one on an iron, although a very striking one, does not give us much information because we have no idea what nickel or chromium would do in an iron.

Enthusiasm With No Apparent Reason.

Then when we come to Dr. Guillet's own tests (*Journal Iron and Steel Institute*, 1905, II, 2118), and find that comparing his 0.20 to 0.30 per cent. vanadium steels with his 0.75 to 1 per cent. vanadium steels (he gives us no common steel tests for comparison), the latter in the great majority of cases either show no improvement at all over the former, or else an improvement in tensile strength and elasticity only at the expense of ductility and toughness, and that in the remaining cases—the cases where there really is improvement in 1 per cent. vanadium steels over 0.25 per cent. vanadium steels—the improvement does not seem greater than that we would expect from nickel or chromium, we are puzzled to account for his very evident high opinion of vanadium, a high opinion which is at its maximum in the case of quenched pearlitic nickel vanadium steels. Here he becomes very enthusiastic indeed, and the reason for his enthusiasm is not

very apparent, except he has some sources of information outside his tests. These latter do not seem to justify enthusiasm. For when we hunt out, in another article, results of quenched nickel chrome steels that he tests, and compare them with these wonderful quenched nickel vanadium steels, we see that there is practically no difference in favor of vanadium, thus:

	Tensile strength.	Elongation. Per cent.	Shock test.	Hard- ness.
C, 0.20; Ni, 6; V, 0.50.....	144	10	9	321
C, 0.20; Ni, 6; Cr, 0.50.....	143	10	11	277
Again:				
C, 0.20; Ni, 6; V, 0.70.....	159.5	10	1	321
C, 0.20; Ni, 6; W, 2.....	155	8	9	387
Again:				
C, 0.20; Ni, 6; V, 0.50.....	144	10	9	321
C, 0.20; Ni, 5; Cr, 3.....	143	7	8	444

These comparisons, the best that could be found, make us so skeptical about the great superiority of quenched nickel vanadium steels that we look further through his article on quaternary steels to see if vanadium has any superiority even over the cheapest and most common of elements in the way of improving quenched nickel steels. We find:

	Tensile strength.	Elongation. Per cent.	Shock test.	Hard- ness.
C, 0.20; Ni, 2; V, 0.30.....	117	8	11	387
C, 0.20; Ni, 2; Si, 1.5.....	129	0	3	351
Again:				
C, 0.20; Ni, 2; V, 1.....	140	6	6	269
C, 0.20; Ni, 2; Si, 0.50.....	169	3	6	418

From which it might be inferred that silicon, if not too high, is considerably superior to vanadium for use in quenched nickel steels. None of the above comparisons are selected, but all were taken that could be found, most of his tests being made on high nickel and not on pearlitic nickel steels, and but few tests on pearlitic steels are given. But these few utterly fail to corroborate the latter part of his statement that "Vanadium has the property of causing an extraordinary increase in the tensile strength of the quenched pearlitic nickel steels by comparison with the normal steels; while the elongations remain fair and the steels are markedly non-brittle. The author cannot call to mind any other element which is capable of giving similar results." On the contrary, it would seem from his own results, quoted above, that almost any other element is capable of giving similar results.

It can hardly be possible that such a universally favorable opinion of vanadium as exists in the iron trade to-day can have no foundation whatever to rest on, but why is it that when a famous investigator sets out to investigate and to prove, his results can be gone over with a fine-tooth comb, so to speak, without dragging to light any corroborative instances; and how is it that in spite of this poverty of proof, the investigator still stoutly adheres to this favorable belief?

A Peculiar View of the Effect of Vanadium.

In a subsequent article on "Quaternary Steels" (*Journal Iron and Steel Institute*, 1906, II, 1), Dr. Guillet again takes up vanadium, makes fresh tests, and says: "The author believes more firmly than ever in the future of nickel-vanadium steel, but he is in the position to affirm that investigations should be confined to steels containing from 0.10 to 0.30 per cent. carbon, from 2 to 7 per cent. nickel and 0.10 to 0.30 per cent. vanadium. Indeed, it is quite possible that it might become necessary to limit the amount of vanadium permissible to below 0.05 per cent." That is to say, he still believes in vanadium (more firmly than ever, in fact), but the less you use of it the better!

The obvious view favorable to vanadium that can be taken from Dr. Guillet's latest statement is that vanadium does not act to improve steel because of any good quality that it itself imparts to steel (it imparts no good quality to steel, but just the reverse), but because it takes out of the steel another bad element—oxygen—and therefore we

want just enough of it to accomplish this, and no more. The answer to this view of the case is that although it is doubtless quite true that vanadium is a far better deoxidant than carbon, manganese or silicon, yet at the same time these latter are strong deoxidants, and it is hard to believe that, at the temperature of molten steel for a considerable time, the carbon, manganese and silicon of the charge could fail to take care of all the oxygen present; that is, in a crucible steel for instance, which finishes up with 1 per cent. carbon, 0.30 per cent. manganese and 0.20 per cent. silicon, there is enough of these elements to make it impossible for the oxygen to withstand their attacks through all the period of melting, "killing" and teeming, and therefore if they take out all the oxygen, the vanadium could do no more, no matter how much stronger a deoxidant it may be.

So-Called Deoxidizing.

The addition of aluminum or silicon to the charge just before teeming is sometimes spoken of as a deoxidizing operation, but, according to Brinell and other authorities, it is not so at all, but quiets the steel simply because it increases the solubility of the gases in the steel; the oxygen, it would seem, being already disposed of by the carbon, manganese and silicon originally present in the charge. But cannot, and as a matter of fact does not, the dissolved gas consist mainly of carbon dioxide or carbon monoxide? According to well-known facts, manganese and silicon at a low temperature have a greater affinity for oxygen than carbon has. It is on this principle that the making of washed metal depends. Therefore, we would expect that while yet in the furnace the gases would consist of oxides of carbon mainly, but that when withdrawn from the furnace, the silicon and manganese present in the charge would take out and transfer to the slag the oxygen of the carbon dioxide and monoxide.

As a matter of fact, investigation has shown the gases of cold steel to be not carbon oxides but hydrogen and nitrogen, quite as bad of course in their effect on the steel as carbon monoxide or dioxide, and absolutely beyond the curative power of vanadium. But if there is no oxygen in crucible steel, how is it that the best crucible steel will always show "slag and oxides"? The answer is that it must be all slag and no oxide. The teeming of the steel mixes up the slag with the steel to some extent, and the metal cools too quickly to permit it to all rise to the top. Right here the thought occurs, why not avoid this mixing by letting the steel get cold in the crucible in such cases where the crucible is in use for the last time? The practical objection probably would be that the crucible could not be cleanly broken away from the steel when cold, and it would be too much trouble to remove it.

To return to our subject: The case is entirely different in the strongly oxidizing open hearth furnace, and with a charge in which the carbon, manganese and silicon have been practically all burnt out. Here it would not be at all surprising if the dissolved carbon monoxide and carbon dioxide gases were not destroyed by the manganese added to the ladle before teeming, the time for the reaction being a short one. As a matter of fact, Belloc (*Bull. Soc. Encouragement*, 110, 492), has proved that the gases dissolved or occluded in a cold open hearth steel containing carbon 0.10 per cent., silicon 0.03 per cent., manganese 0.38 per cent., consist very largely of oxides of carbon—dioxide and monoxide—also hydrogen and nitrogen. In such a case, then, it is quite probable that vanadium (or perhaps better, titanium, since the latter is supposed to remove nitrogen also) would serve better than manganese to add to the ladle. But even with crucible steel it is not at all beyond dispute that the carbon, manganese and silicon of a charge take out all of the oxygen. Perhaps they do not take out all the oxygen. Perhaps, therefore, the addition of vanadium serves a useful purpose, and makes a sure job of it.

A Series of Shock Tests Needed.

But with all this granted, the puzzling question remains, why is it so hard to find actual tangible proofs of vanadium's usefulness in the experiments so far made and published? What the iron trade needs at the present time is a series of shock tests where vanadium steels, preferably hardened, are compared with nickel, chromium, tungsten, manganese and silicon steels made exactly

the same way. Doubtless this has been done over and over again by different works and the results found favorable but not published. But, if so, why do those results that have been published prove so inconclusive?

One cannot believe the iron trade entirely wrong in its estimate of vanadium, but may be excused, at the same time, for having doubts; especially as it is a matter of past experience that the iron trade is not much disposed to take the trouble to get to the bottom of anything chemical, but prefers to guess at it. Thus, for instance, in the matter of such common elements as phosphorus and sulphur in steel, the trade spends thousands of dollars every year in making phosphorus and sulphur tests, but has never yet, as far as we are aware, spent a single cent to find out just how much phosphorus or sulphur it takes to spoil the steel.

The Estimation of Vanadium.

So, although whether or not vanadium is all that it is supposed to be may remain an unsettled question for many a long year to come, one thing is sure: the chemist will be busy making vanadium tests. Luckily this is a simple matter, as follows: Reduction by strong hydrochloric acid to the V_2O_3 condition, evaporation with sulphuric acid to complete expulsion of the hydrochloric, dilution and titration with permanganate. This is easy if the iron be not first separated. But A. A. Blair, in a recent article in the *Journal* of the American Chemical Society, follows Campagne in stating that the iron must be separated first from the vanadium before the reduction and titration of the latter takes place. Why? It makes the method a tedious one. The only reason the writer can see is the fact that the end point of titration cannot be distinguished with much iron present, and the liquid hot when titrated. But if the liquid (in a bulk of 350 c.c.) be cold then there is no difficulty in getting the end point of the titration. Must the liquid then be hot? The following tests with vanadium solution, titrations made in the cold, seem to answer this question in the negative:

Per cent. found: 1.15; 1.13; 1.15; 1.14; 1.15; 1.11; 1.13; 1.13; 1.13; 1.12; 1.13; 1.13; 1.15; 1.16.
Per cent. present, by reduction with zinc to V_2O_3 form....1.13
Per cent. present, by mercurous nitrate.....1.10

Then a new vanadium chloride solution was analyzed, found to contain no impurity except alkali and the vanadium determined in an aliquot portion gravimetrically by mercurous nitrate precipitation with the following results:

Vanadium per cent.: 1.36; 1.39; 1.34; 1.37; 1.35; 1.36; 1.36.
Then volumetric titrating cold, per cent.: 1.35; 1.33; 1.36; 1.33; 1.29; 1.31; 1.29.
Then with iron present equivalent to a sample of steel, titrating cold: 1.37; 1.38; 1.39; 1.38; 1.37; 1.38; 1.36; 1.38; 1.30.
Then without iron, titrating hot: 1.37; 1.37.

A point is made by Treadwell that has so far, it appears, been entirely ignored by other analysts. He states that strong hydrochloric acid reduces V_2O_5 to a variable mixture of V_2O_4 and V_2O_3 . If this be true, results by the above would come too high. The above results quoted by the writer were plainly not too high, but yet he had three results that were too high, as follows: 1.48; 1.52; 1.55. He attributes these three results to the fact stated by Dr. Treadwell, but evidently this error is one that occurs rarely. To avoid it, the writer, when the liquid is ready for titration, instead of titrating, evaporates again to pastiness, to give the V_2O_5 , if present, plenty of opportunity to oxidize up to V_2O_5 . But whether or not this precaution is efficacious, and serves its purpose, the writer cannot say positively. He has not had any high results since its adoption, but may have yet some time. Or a current of air through the hot liquid before titration might serve.

A blank test made with steel drillings vanadium free must be made, not once for all, but each time a test is made, or at least every time a different bottle of sulphuric acid is used. The blank seems to vary with the sulphuric acid. But it is safest to do a blank every time.

In chromium vanadium steels, it must be found by trial, adding definite amounts of chromium to vanadium-free drillings—how much of the permanganate is used in neutralizing the green color imparted by the chromium.

A Unique Fire Alarm System.

That of the Maryland Steel Company at Sparrows Point.

BY J. H. K. SHANNAHAN, JR.

The town of Sparrows Point, Md., where the plant of the Maryland Steel Company is located, is situated at the mouth of the Patapsco River, and is well laid out and carefully cared for by an efficient organization under the direction of the steel company. Among the up-to-date conveniences of the town are an underground sewer system, electric lights, a water system which draws its supply from artesian wells driven to a depth of from 150 to 400 ft.; a uniformed police force and a volunteer fire department. The fire department has a

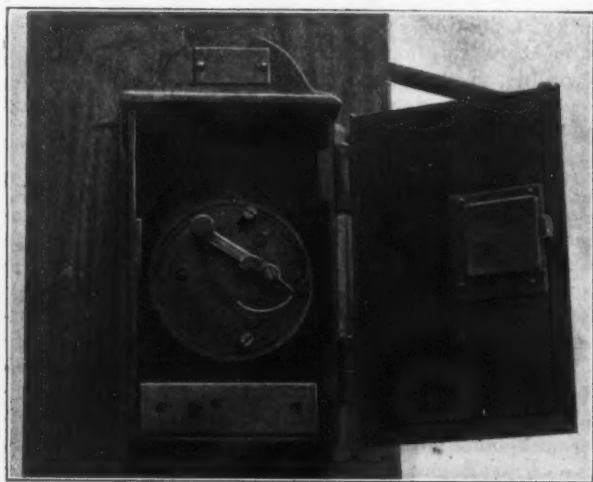


Fig. 1.—One of the Fire Alarm Boxes.

hose house, centrally located, with auxiliary equipment stationed at other points about the town and works.

Perhaps one of the most unique features of the town and certainly one of the most interesting, is the fire alarm system, which is the invention of one of its own residents, A. J. Woodworth, the chief electrician of the steel company. This system, which is electrically operated, sounds each alarm by blowing a number of blasts simultaneously on three large steam whistles supplied by boilers which are constantly under steam. The numbers blown are those of the box from which the alarm is turned in, and as the whistles are located, one at the extreme western end of the works, one near the center and the other at the eastern end of the town, the whole town, including the plant, is made aware of the breaking out of a fire. Cards giving the numbers and locations of the boxes are widely distributed among the different offices in the works and the residences and public places of the town.

All members of the volunteer fire department are employees of the steel company or of the Sparrows Point Store Company. (Only employees of one or the other concerns live at Sparrows Point.) The fire department is divided into several well drilled companies. When an alarm is turned in, the members of the fire department are allowed to leave their work and proceed at once to the equipment station of the company to which they belong. If the men are detained at a fire after working hours, they are allowed overtime just as though they were in the shops on special work. Usually a company is made up of the men working in a given department, so that in case of a fire in that department, prompt service may be had. The other companies also respond, but by distributing the several companies in this manner, the work of the department is facilitated. The steel company furnishes and maintains all equipment and provides the department with a commodious meeting place, with reading room, &c.

The town, including the steel company's works, covers an area of probably two square miles, and has 15 alarm boxes distributed at suitable places. These are

numbered as follows: 4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 23, 24, 25, 32 and 33. Obviously a number having a cipher in it could not be blown and the numbers given the boxes were selected with a view of being easily distinguishable. Those numbers consisting of a single numeral are blown as short blasts. For a number in which two numerals appear, for instance, 24, the signal would be two short blasts followed by a pause, then four short blasts. The signal, whatever it may be, is repeated four times from the one turning in of the alarm.

The alarm boxes, Fig. 1, are of iron, similar in exterior appearance to those used in some of the cities. When the system was first installed the key to each box was placed on the door of the box behind a thin piece of glass. This proved too much of a temptation to the mischievous to turn in false alarms, so now two keys for each box are left at houses within a few yards of the pole. A sign over the box tells where the keys may be found.

When a fire is discovered, the door is unlocked, exposing a single lever, which the instructions explain is to be pulled down to the left as far as it will go, and then released. This winds a clockwork arrangement which revolves a small wheel notched with as many notches as there are blasts to be blown. If the signal is 24, the wheel will have two notches, a space, then four more, as in the diagram, Fig. 2. Just above the wheel is an arm or contact spring, set in hard rubber, whose metal point just touches the circumference of the wheel, thus forming a closed circuit. (One advantage of operating the system on a closed circuit is that if anything gets out of order, the circuit will be opened, which will cause the whistle to make a prolonged blast.) As this notched wheel, which is about $1\frac{1}{4}$ in. in diameter, revolves, the contact spring or arm comes to the vacant space caused by the notch, breaking the circuit. This releases a contact arm of a relay which is drawn back by a spring, making a contact that closes a secondary circuit through the coil operating the whistle.

The spring of the clockwork, which revolves the signal wheel, is strong enough to cause the wheel to make four complete revolutions, thus causing the signal to be repeated four times. This can be regulated at will to control the speed with which the signal is given.

The system is so arranged that an alarm cannot be turned in from two different boxes at the same time. The spring, which may be seen attached to the side of

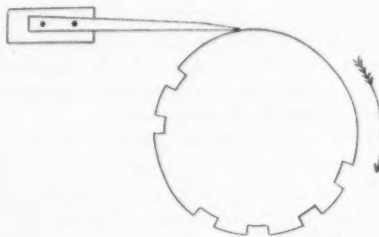


Fig. 2.—Diagram Showing the Signal Sender for the Number 24.

the box in Fig. 1, when the lever is pulled down, comes in contact with the spring on the end of the lever, which cuts out all other alarm boxes by short circuiting them, so that an alarm turned in from them would have no effect at all. The first signal given would be blown correctly.

By means of the button provided in the lower part of the box, signals may be blown independent of the clockwork signal wheel, indicating by a single blast that the fire is out, or by other blasts, which cannot be mistaken as another alarm, that more water is needed. An alarm is turned in every day at noon from first one box, then another, to test them all, and as this is thoroughly understood, the alarm sounded at that hour is not responded to.

As the system has been in continuous operation for about three years, with entire satisfaction, its practicability has been determined. While simple in design and operation, its simplicity is its greatest guarantee of efficient service.

The Struggle in the German Iron Industry.

(By an Occasional Correspondent.)

MAINZ, October 22, 1908.—When in the course of the past year, the retrograde movement in business set in, the prices of finished iron and steel declined rapidly. It was particularly in the products of the open hearth and of the "pure" rolling mills, the so-called B products, that prices within a short time reached a very low level. It was lowest, probably, in the late fall of last year, and was not even overcome in the spring. Under these circumstances the struggle was resumed by the consumers of billets and blooms, and particularly the open hearth steel works, and "pure" rolling mills against the price policy of the raw material syndicates. For some time this fight has become more bitter, the relations between the "pure" and "mixed" plants having grown more strained since the Steel Syndicate and the raw material syndicates have refused to put down the prices for raw materials and for coal.

The development of the German iron industry has not been uniform through its history. Numerous rolling mills were established on the one hand and many blast furnace plants on the other. The obvious advantages of concentrated operations finally led to the rounding out or the consolidation into large "mixed" plants which embrace all the phases of iron manufacture from the pig iron to the finished product. Naturally, not all the works have been able to develop in this direction. Geographical position, at a distance from coal and ore, the lack of the enormous capital for such expansion and the characteristic German plan of retaining possession for one's self and family, all stood in the way. The result is that there are now in existence:

First, the great "mixed" works, who begin with pig iron, manufacture everything themselves, and partly own their coal and ore.

Second, the open hearth steel works, who must purchase pig iron and other charging materials, and the "pure" rolling mills dependent upon the market for billets and blooms.

The Claims of the Dependent Works.

Between these two groups and the "mixed" works there exists in Germany a deep economic contrast which is explained by the unfavorable position of the former, as contrasted with the latter. The opinion is widely held that the much greater advantages of the "mixed" works are due exclusively to the natural results of concentrated operations and that the misery of the dependent plants is the natural consequence (deplorable possibly, but yet necessary) of economic development.

Concentrated operations do entail certain natural advantages, particularly in the production of the heavier lines. But in the products which are chiefly made by the dependent mills, the advantages referred to are forced to the background by the greater economy in handling small plants, by the greater ease of supervision, and above all, by their greater adaptability to the desires and the quality requirements of customers. The principal and almost the only reason for the superiority of the great mixed works lies in the fact that they can build up their entire production to the finished product upon duty free raw material, since they need only buy such ore as they do not themselves control, and that is duty free. Nearly the entire production of these works is free from customs payments.

The open hearth steel works produce steel from a charge which consists of about 25 per cent. of pig iron and about 75 per cent. of scrap. The duty on pig iron and scrap is 10 marks per metric ton of 1000 kilos. Calculated on 1000 kilos of steel billets, this means a customs charge of about 11 marks, while the large mixed basic Bessemer steel works may manufacture the pig iron which is the basis of their steel from free ore. The "pure" rolling mills who depend upon the open billet market are in an even more unsatisfactory position. The raw material of these mills—steel billets—is subject to a duty of 15 marks per ton. Figured on the finished product (sheets, bars, hoops, &c.), this is equivalent to

a duty of 18 to 20 marks per ton. This the large "mixed" works do not bear, because their only raw material (ore) is duty free.

In England the movement in favor of protective duties is gaining ground. The abandonment on the part of Great Britain of free trade would, without doubt, seriously hurt the German industries. The German production of pig iron and of steel billets is so large that in normal times it is not, by far, absorbed by the home consumption. This means that there must be heavy exports. In free competition, the home prices would naturally be lowered, in view of this necessity to export, and the import duty on pig iron and steel could only be utilized to a very small degree. The open hearth works and "pure" rolling mills therefore demand that they be placed on an equal basis with the "mixed" works by being granted their raw material free of duty, and they regard this demand as a simple act of justice. They ask that the duties on pig iron, scrap and steel be suspended, and later on be abolished altogether. This removal of these duties, according to the opinion of the "pure" rolling mills, would strengthen the hands of the free traders in England and hamper the advocates of a protective policy.

The Reply of the Steel Syndicate.

Naturally, the German Steel Syndicate could not remain silent under these attacks, and a reply was made in an elaborate paper. The fact is not denied that the "pure" rolling mills have a difficult struggle, but they cannot expect the Steel Syndicate to abandon the manufacture of B products for their sakes and to stop their mills. The "mixed" works are as much—or possibly as little—finishing mills as the "pure" rolling mills. The difference between them consists in that the "pure" rolling mills must buy their steel, while the "mixed" works produce it themselves. Formerly the "pure" rolling mills did partly make their own steel, but later, relying upon the competition among the "mixed" works, they extended their rolling mill facilities without thinking of permanently securing their supply of steel. Then the "mixed" works had come to an agreement, and the "pure" rolling mills could not expect the steel works to go on fighting simply for their sake. The Steel Syndicate, during the last boom, delivered steel to the German rolling mills at an expense of their foreign customers. On the rising market the Steel Syndicate sold to the "pure" rolling mills for long deliveries and even at a time when prices had risen again, they had delivered at the old prices. Now the Steel Syndicate must try to recover, by concessions in prices, their foreign customers whom they had lost for the sake of the "pure" rolling mills.

To remove the steel duty would be to cut into their own flesh, even for the petitioners who had not proved that the removal of the German iron duties would put them into a better position under prevailing conditions. The contrary would undoubtedly take place for themselves and for the whole German iron industry. All who are cognizant of the present development in the British iron industry agree in the conviction that it will not do to weaken Germany's fiscal position against her. If the great steel producing works of England do not yet furnish the rolling mills there with their requirements of steel—possibly with the idea that it will not do to supply steel to one's competitor—this does not prove that it will not be done later on. It might, under certain circumstances, entail the greatest sacrifices to recover the protection necessary for the German iron industry if the existing duties were disrupted. So far as the export of steel to England is concerned, Great Britain does not yet produce enough for its manufacturing industries and Germany has no call to encourage an increase in steel manufacture on the part of England, by declining to deliver steel to them. If Germany stopped supplying steel to England, then the English makers of sheets and wire would still, in normal times, be able to secure their steel for their home consumption cheaper than the German mills and wire drawers could get it, because then America, France, Belgium, &c., would jump into the market.

In spite of the progress made, the German iron in-

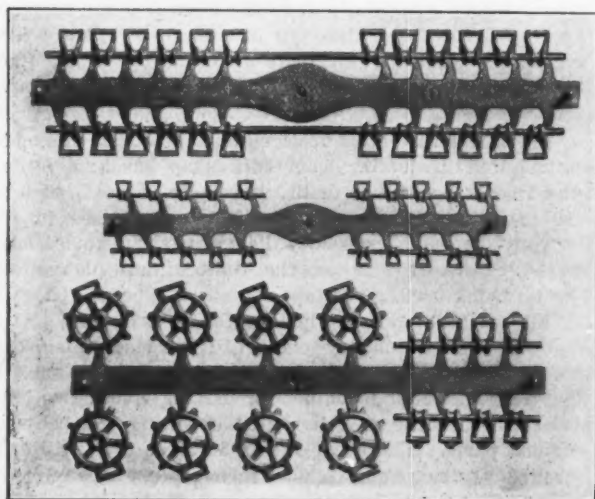
dustry has higher costs than competitors in England, Belgium and France. English authorities claim that even in spite of the German protective duties the English iron industry would crowd back the German, if it were not for the existence of the iron syndicates in Germany. But England is at work on the removal of this lack of organization. In the United States there is the Steel Corporation as a constant threat against the iron industry of the Old World. If the Steel Syndicate in Germany were to break down, which would undoubtedly take place if the duties on steel billets were removed, then the United States Steel Corporation would not have to fear retaliation from any quarter, while to-day it extends its hand to international arrangements. With such competitors in the world's markets, it is a matter of great regret that success has not yet attended the efforts to create syndicates in the B products. But it is entirely wrong to advocate measures which, like the removal of the protective duty on pig iron and steel billets, would tend to disrupt the German syndicates. It is clear that for Germany the situation in the world's markets is as unfavorable as possible to a proposal to remove the duties on pig iron and steel. The United States and France will retain their high protective duties and England is making steady progress in tariff reform. All signs point to the fact that England has entered a period of passing from the free trade to the protective principle. Therefore, Germany must not disrupt the existing protective tariff unless it is not to be put at a disadvantage in the coming negotiations with England. Even the most ardent opponent of the duty on steel must confess that this duty should be kept intact, at least, for the present, as a means of trading, in the negotiations with England. The indications are multiplying, too, that the English iron industry is aiming at the consolidations necessary for aggressive action and that its technical practice is improving.

As yet the German government has not taken any measures in this struggle. It is probable that the Reichstag, which reassembles next month, will discuss the question.

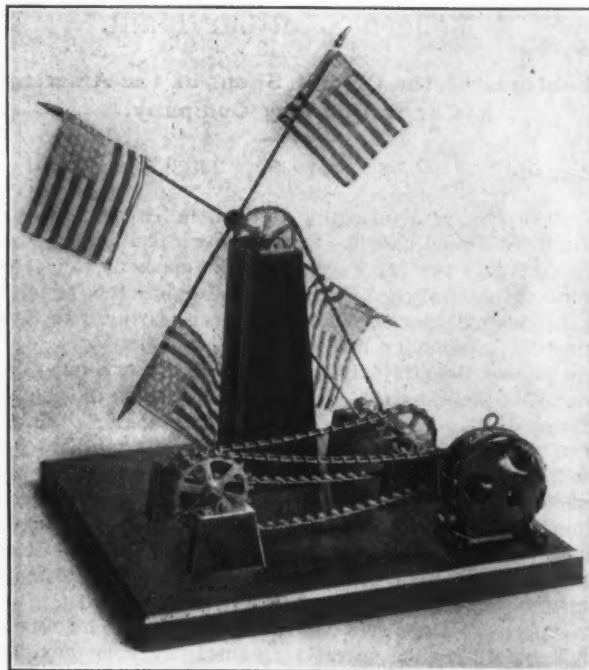
Remarkably Small Ohio Driving Chain.

An interesting exhibit at the recent convention of the National Association of Agricultural Implement and Vehicular Manufacturers, at Columbus, Ohio, was that made jointly by the Ohio Malleable Iron Company and the Jeffrey Mfg. Company of that city. This contained a display of malleable detachable link chains, including many specimens which illustrated the substantial progress recently made by the former company in the refinement and production of malleable iron. The extremely malleable and ductile qualities and high tensile strength in the iron were shown by chain links bent double and distorted in form by impact, torsion, bending and tensile strains without the occurrence of fractures.

Two very small chains were also displayed to illus-



Patterns from Which the Small Chains Are Cast by the Ohio Malleable Iron Company.



Running Exhibit Shown by the Jeffrey Mfg. Company and the Ohio Malleable Iron Company.

trate the molding qualities of the iron resulting from the high degree of fluidity obtained. The links composing the larger of these three chains were of $\frac{3}{8}$ -in. pitch, 5-16 in. wide, with a maximum area in cross section of 1-16 in., while those of the smaller chain were 5-32 in. wide, 3-16 in. pitch, with a maximum cross sectional area of only 1-32 in. This is the more striking when it is considered that the sectional area of a conduit through which iron will run has commonly been limited to 3-32 in. For this achievement much credit is also due to skillful molding.

The larger of these chains is designated as Ohio Special .08 and the smaller as .008. Lengths of both were shown in suspension from scales, the .08 sustaining a weight of 75 lb. and the .008 of 15 lb. The pull on the former was increased by hand to 130 lb. without visible effect on the links, and as these were assembled as made, without the usual tests to develop weak or defective parts, it may be safely assumed that with such parts eliminated the larger chain would develop a safe working strength of about 30 lb., or approximately one-half that of the ordinary commercial No. 25, which has four times its maximum area in cross section.

To demonstrate the accuracy of pitch and uniformity in shape of the links composing these chains two running exhibits were shown, one a small rotary fan and the other a group of American flags, each driven by an electric motor. The former was driven through a single strand of .08 chain, and the latter, which is herewith illustrated, by two strands of .08 and one strand of .008 chain, three reductions being made. The chain speed was high in both cases, and the operation was very smooth and quiet.

At the exhibit souvenirs were distributed, consisting of a watch fob having a short length of .08 chain attached, from which a nine-tooth sprocket wheel of corresponding pitch was suspended, and three links of .008 chain pendant in the form of a stick pin. The gated pattern from which the parts forming these souvenirs were cast, imbedded in the match, were also on exhibition. This is shown in the other of the accompanying engravings.

It is stated by the companies that no special heat or composition of iron was resorted to in producing these chains, nor in fact any of the specimen links on exhibition, but that all were made in the ordinary way from regular heats and correspond in all respects to the daily run of the foundry. The Jeffrey Mfg. Company is the sole distributor of all the chains manufactured by the Ohio Malleable Iron Company.

A Modern Steel Car Plant.*

Features of the Detroit Shops of the American Car & Foundry Company.

BY HORACE H. LANE.

The regular steel car of 100,000 lb. capacity weighs from 40,000 to 45,000 lb. In designing a plant to turn out 50 steel cars per day we must handle approximately 1100 tons of material each day. The operations this material goes through may be summed up as shearing, punching, pressing, assembling and riveting.

To do these rapidly and economically we must lay out this plant so that the material progresses steadily forward from the time it enters as raw material at one end until it emerges as the finished car at the other. We will not discuss the building of the trucks, as that is usually done in another shop. The material we have to handle consists mainly of channels, angles and plates. In addition to this we must handle the drawbars, bolsters, brake rigging and some smaller parts which go to make up the car.

After we have selected the necessary machine tools for performing the operations named, we must next arrange them in the building so that we shall be able to fabricate this material with the least amount of handling, leaving the necessary room between the machines for storing the material being worked without making an unnecessarily large and expensive building, as an excessive amount of space not only means expense of the building and ground, but increases the distance over which much of this material must be carried.

At the Detroit plant of the American Car & Foundry Company the principal tools are four heavy shears, four multiple punches and four large presses.

Shears.

The four shears are capable of shearing a plate 10 ft. wide and 1 in. thick. There are also smaller shears of various types, including a special angle shear on a turntable so that long angles can be cut at any angle without having to swing them around the shop; that is, the shear is turned so that it stands at an angle to the pile of material, thereby economizing shop room and labor.

Punches.

There are four multiple punches capable of punching a row of holes entirely across a plate 10 ft. wide at one stroke of the machine, and of sufficient length to take plates of 50 ft. in length. These machines deserve special mention, as they are self-spacing. There are two levers at the side of the machine (where the operator stands) like the reverse lever on a locomotive and about the same size. These levers have graduated arcs, one being graduated for inches and the other for eighths. By simply throwing these levers the machine will space any distance desired up to 7 in.; in other words, if you have a plate across which you want to punch a row of holes every 7 in., and this plate is started in the machine, with the spacing lever set to 7 in., the machine will automatically feed it through, punching a row of holes every 7 in. If instead of 7 in. you want to make it $4\frac{1}{2}$ in. or any other number, you simply set the lever to read that way. A great deal of the work put through these machines has various spacings on the same sheet. The operator, keeping his schedule before him, will set these levers to the proper spacing without stopping the machine, so that the plate goes forward automatically, first making a space of 4 in., another of $2\frac{1}{2}$ in. or whatever may be wanted. In addition to this the punches are all arranged with gags so that any punch can be instantly thrown out and the holes omitted wherever it is desired. The operator also has a smaller lever in front by which he can instantly gag all the punches if for any reason he wishes to omit one spacing, or if he should possibly notice before the punches go down that he had made a wrong spacing, he could prevent the punches from doing any work. These gags

consist of steel blocks about 2 in. thick, above the punches, which are simply withdrawn so that the punch, instead of going through the sheet, slides up into the socket, or rather the punch and socket both slide up into the upper head or ram of the machine. These machines not only have the advantage of saving an immense amount of labor in marking and punching, but will do the work much more accurately than it is possible to do it by hand. The American Car & Foundry Company is, I believe, the only car manufacturer to use this type of machine. In addition to these multiple self-spacing punches is a variety of both small and large punches, such as will be found in any good structural shop. On some of the larger punches a great deal of special work can be done, such as coping flanges on I-beams or cutting the angles or channels to any special shape desired.

Presses.

This shop has two 1000-ton and two 500-ton presses. By 1000-ton we mean a press which will exert a pressure of 1000 tons on the work. Many cars have pressed steel sills. These are pressed cold from plates usually $\frac{1}{2}$ in. thick and perhaps 30 in. wide at the center, tapering down to 18 or 20 in. at the end, these plates, of course, being the full length of the car. This work being too long to be done at one impression, the dies are made in three sections and all three sets of dies are placed on the press at once. The plate is pushed into the press and placed so that one-third of it is pressed. It is then pushed in farther and the middle section is pressed and is then pushed on for the third impression, each section of the sheet being pressed to its final shape at one stroke so that after the sheet has been passed through the press it is finished so far as the pressing is concerned. The dies for this work are about the heaviest things to be handled in the shop. The traveling cranes are made heavy enough to handle the dies, which are of cast iron, and which have to be changed every time the press starts on a new lot of work. One of the 500-ton presses is what is known as the flanging press. This has three cylinders, the main plunger remaining stationary while the two auxiliary plungers push down the clamping bar, holding the sheet in place until the main platen comes down and bends it over. In some cars a great many sheets have the edges flanged at 90 degrees or less, according to the design of the car. This work is done on this press. The presses used at this plant all have a fixed lower platen while the upper platen descends on the work. In some other plants presses are used where the upper platen remains stationary and the lower one rises. These are perhaps more particularly adapted to small work. On some of the smaller presses I have seen men insert four pieces simultaneously from all four sides of the press, so that four pieces were pressed at once.

Each of these presses has near it a heating furnace, as most of the work pressed is heated. The heating furnaces at the large presses are 20 x 30 ft. and will take in any part of a car which needs to be heated. These are reverberatory furnaces, and in the Detroit plant they are fired with soft coal, although in some other plants they are heated with oil. In addition to the above machines there are saws for cutting off I-beams or other special shapes.

There is a variety of other equipment which cannot be enumerated in detail. The truck shop has axle lathes, wheel borers, arch bar drills, wheel presses, &c., such as are used in any truck shop. The axle lathes in the Detroit shop are especially heavy modern tools, each driven by its own motor, the Bullock multiple voltage system being used, giving six changes of speed. There is a full machine shop equipment for taking care of the tools, including a heavy planer 10 ft. wide, this being necessary for fitting up the dies used in the presses. There are also four machines for making rivets, two bulldozers for bending arch bars and upsetting and pressing various parts. There are about 30 rivet fires scattered throughout the plant. These furnaces are heated with oil and have an air blast conveyed through an underground tile pipe system, the air being furnished by blowers direct connected to high speed motors.

* Extracts from a paper read before the Detroit Engineering Society.

Riveting.

In a steel hopper car of 100,000 lb. capacity there are about 2400 rivets to be driven. To be exact, on Pennsylvania hoppers recently built at this plant there were 2434 rivets, on New York Central gondolas 2449 rivets, and on Southern hoppers 2340, so that when this plant was building 100 cars a day, as it was for a considerable time last year, it was driving 240,000 rivets per day, the day including a night shift.

To drive this large number of rivets to the best advantage the material is assembled as far as possible in sections, these being riveted on machines especially adapted for each particular work. For example, the whole side of a hopper or gondola car is bolted together with erection bolts and hung from a trolley over the top of a deep gap riveter. These riveters are 10 ft. gap, and in this plant we have nine of them. The Standard Steel Car Company's shop at Hammond has seven of 114 in. gap. These riveters have a heavy U-shaped frame with the open side up and are placed in a pit so that the rivet being driven is about 4 ft. from the floor. The operator who handles the riveter also has within reach two levers whereby he can raise and lower the work and also cause it to travel endwise. On a large surface like the side of a car, when handled this way, the rivets can be driven very rapidly, from a dozen to 20 rivets being sometimes put in in a minute, depending, of course, upon the accessibility of the work and the rapidity with which the operator can move it. One man shoves in the rivets, another man operates the machine and moves the work, while usually a couple more men are required to steady the work so as to bring the rivets into position rapidly. Not only car sides, but many other parts, are riveted before the work reaches the erection floor; the sills have the lugs and malleable parts all riveted in the machine before the sill goes to the erecting floor. Bolsters and many other parts of the car are riveted complete in the same manner, much of the smaller work being done on small hydraulic riveters. When the work finally comes to the erecting floor a great many rivets in every car must necessarily be driven with a pneumatic riveter, held in the hand, known in shop parlance as a "gun." These machines, such as you have all seen used in the field on structural work, do this work very rapidly, but when a hundred of them are going at once inside a building conversation is necessarily prohibited; even a megaphone would be useless. A fixed hydraulic or pneumatic riveter works so much more rapidly and quietly than the gun that, so far as possible, all work is done on the fixed machines. Some work which cannot be done on the fixed machines is done on the erecting floor with a portable riveter, which carries an air cylinder and heads the rivet at one stroke the same as the fixed machine; the best type has the cylinder attached to a toggle joint so that a small cylinder can exert the necessary pressure. In a great many places, especially in assembling the underframe, these machines can be used efficiently. A portable hydraulic riveter has been tried, but it requires such complicated connections to take care of the supply and return water that it is not practical.

Erection.

Two systems of erection are used. In some shops a car is erected on a pair of horses and each car is completed in its particular place; that is, one set of men builds the car complete in a fixed place, there being a number of these sets of men according to the size of the shop. The other system might be called the progressive system. In this the first gang performs a certain operation; the car is then passed along on its own trucks to the next gang and from it to another, in all about eight or ten gangs being used before the car is completed. This latter process is the one used in the Detroit plant and has been very satisfactory. The system as carried on here consists of placing the trucks on the erection floor and at once beginning the erection of the car on these trucks, the center sill being dropped on first, then the cross pieces or body bolsters, then the side sills and so on. The first gang of men simply gets far enough to put on the side sills, usually throwing a short plank across each truck while this is being done. I might also mention

that the trucks are shoved closer together than their normal position so that the drawheads can be put in and the men can also get at the rivets over the trucks. This car is then pushed along to the other gangs who do the riveting on the underframe, put in the drawheads and assemble the car through its various stages, the underframe being riveted up before the upper part of the car is erected upon it. The same progressive system is used in the Berwick shops. The Pressed Steel Car Company in Pittsburgh use the other system, building each car on a pair of horses. The Standard Steel Car Company also build their cars on horses. At the Berwick shops this plan was tried for a time, but changed over to the progressive system.

There are various points for and against each system, and it might after all be largely a matter of education and training. There are a number of advantages in favor of the progressive system. One is that for the same output very much less floor space and shop building are necessary. The material of each particular kind is placed in the exact spot where it will be used. That is, the center sills, for example, would be placed at the first station; each station has only a certain class of material to look after. The men in that gang have only one particular operation to perform on each car and they become very expert in performing that operation. With a few good men in each gang to take the lead, the gangs can be filled in with common help until they are properly evened up. If not properly evened up, the output is undoubtedly limited by the weakest link in the chain. This is the one objection offered to this system; but with the proper supervision I believe that it is not a serious one. With the fixed system all the material for a car must be delivered at each of the stations. More room is required to get all around the car, as well as to pile up all the different parts required. One point of advantage in this system is that if the work is done on a piece work or premium plan, each car can be erected for a fixed price; in other words, the piece work system is possibly more adaptable where the cars are built on horses than it is where the progressive system is used. Personally I believe that the progressive is the best, but this may be partly because I have been more closely in touch with it.

Painting.

We have now followed the material until it has reached the assembled car, and by the time it reaches the end of the shop it is completed ready for painting. Most of these cars receive three coats of paint, but the work is done very rapidly and in good weather can be done out of doors. The Detroit plant, however, has two large paint shops capable of doing this work under cover if necessary. In the winter these shops are kept heated to a fairly high temperature in order to dry the paint as rapidly as possible. You can readily see that in a shop like the Detroit plant, where a few months ago they were turning out 100 cars per day, to store these cars until three coats of paint were dry requires a very large amount of space. Supposing the cars are painted in three days, we must have room for 300 cars, or nearly three miles of track.

Shop Transportation of Material.

We have so far not taken up the means of transporting the material around the shop. The eastern span of the Detroit plant carries three traveling cranes, 92 ft. span, 10 tons capacity. These cranes all run on the same track, the crane rail being 40 ft. above the ground. In the western span are two more cranes of the same type and capacity. These cranes travel at a high speed, making 480 ft. per minute, and when the shop is running to its full capacity they are kept extremely busy. As the cranes in each span run on the same track, they cannot, of course, pass each other, and each crane must do the work in its own section or the other cranes must get out of the way. Fortunately the work progresses so in these shops that the cranes seldom have to travel more than one-half or one-third of the length of the building. This entire shop is free from any belting, piping or wires which would obstruct the travel of these cranes.

Each one of the large machines has its own motor attached to it. The only shafting and belting in the

building are placed along the side and center columns, and all the piping and wiring are carried in conduits and trenches beneath the floor, so that there is nothing in the way to prevent the cranes from sweeping the entire shop. In the new shop of the Standard Steel Car Company there are two sets of cranes, termed the "local" and "express." One set runs on a track 23 ft. above the floor and the other set 20 ft. higher up.

In addition to the large cranes in the Detroit shop there are a multitude of small cranes of various types throughout the shop. Every machine of any size has its own crane, usually simply a mast and jib provided with an air hoist. These in some cases have the jib long enough so that when the material is taken from one machine it can be swung to the next. In this way the material can go forward without the aid of the main crane. On the erecting floor there is a special overhead structure provided with small hoists at each station, so that each gang of men has its own hoist for handling the material. Most of these in the Detroit plant are what are known as "air engines."

In the steel yard, adjacent to the main shop, the material when it comes in is unloaded from the cars and piled up sometimes 30 ft. high. This yard is swept by two more traveling cranes of the same type as those in the shop.

Power Equipment.

We will now consider the power necessary to operate this plant. A separate power house is built about 40 ft. away from the main shop, near the center, so that the farthest motor is not over 600 ft. from the generator. The power equipment originally installed consisted of four Babcock & Wilcox boilers, 300 hp. each, with an economizer and induced draft apparatus. In the engine room were three Westinghouse vertical compound engines, 18 x 30 x 16, rated 400 hp. each, direct connected to Westinghouse generators of 250 kw., each 240 volts direct current. Two Worthington compound duplex hydraulic pressure pumps, two Ingersoll air compressors, horizontal two-stage cross compound, each of 3000 cu. ft. capacity. In addition to these there is a condensing apparatus consisting of a Worthington barometric condenser with circulating pump, dry vacuum pump and cooling tower, there being no supply of circulating water except the city supply. The steam pressure carried is 160 lb., no superheat. The electrical apparatus is of 220 volts direct current. The hydraulic system carries a pressure of 1500 lb. per square inch, and the pneumatic system 100 lb. There is a large air receiver on the pneumatic system and in the hydraulic system there is also a large receiver for the return water, and two steam accumulators with 50-in. steam cylinders and 16-in. rams. These steam accumulators take up very much less space than the weighed accumulators and are much more lively, the inertia of the moving parts being so much less. Some two years ago this power plant was increased to about twice its former capacity. An overhead coal bin, ash conveyors, four more boilers, another Westinghouse engine and generator, the same as the others, were added. The hydraulic system was also increased by adding a triple expansion duplex pump, steam cylinders, 22, 34 and 56 in. in diameter, 36 in. stroke, 8½-in. plungers, rated capacity 600 cu. ft. per minute, this rating being, of course, against a pressure of 1500 lb. An additional air compressor was put in last year with a capacity of 6000 cu. ft. of free air per minute, so that practically this plant has been doubled all around over the original design.

Steel Passenger Cars.

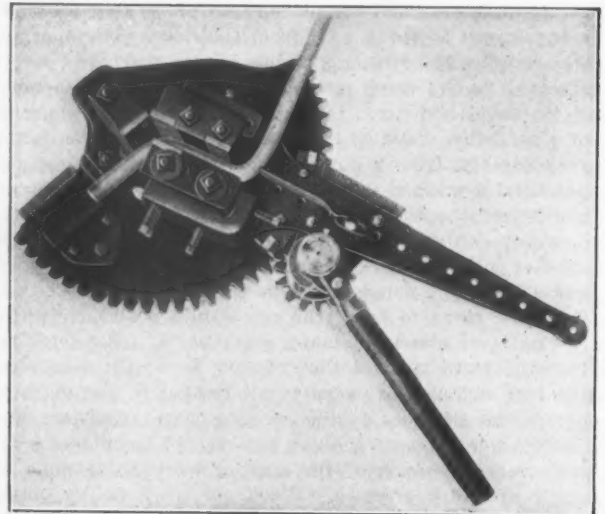
One great field in steel car building has only just been opened up. I refer to steel passenger cars. One of the first orders for steel passenger cars was for the ones used in the New York Subway. These were built by the American Car & Foundry Company in its Berwick plant. Since then quite a few steel passenger cars have been built at this plant. They are now building some magnificent all steel passenger cars which are 84 ft. in length. This work requires different equipment, a shop differently laid out and a different class of help. Other shops are now building steel passenger cars. In some cases the railroads themselves have attempted this work. The begin-

ning of every business is costly, and these first large steel passenger cars have been costly; however, we shall soon see shops properly equipped and designed for this work, and the day for the wooden passenger coach as well as the wooden freight car will be soon ended.

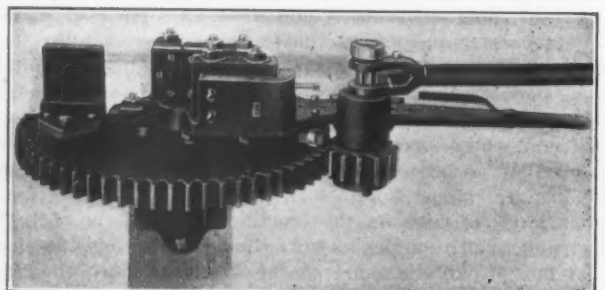
The Wallace Hand Power Bender.

A new machine for bending rods or flat bars to any required angle has recently been brought out by the Wallace Supply Company, 19 South Jefferson street, Chicago, Ill. This machine, top and side views of which are shown in the accompanying illustrations, is intended for manufacturers and also for contractors engaged in reinforced concrete construction work who have occasion to bend rods cold.

This machine, being capable of bending flat stock 4 in. wide by ½ in. thick, or its equivalent, or a rod 1 in. thick without first heating, will be seen to be very power-



Top View.



Side View.

The New Hand Power Bender Sold by the Wallace Supply Company, Chicago, Ill.

ful. It has an auxiliary ratchet lever which operates a pinion engaging a circular rack on the frame of the machine at a ratio of 4 2-3 to 1. The ratchet pawl may be thrown out of engagement and the machine operated with the regular levers, making it suitable for bending light stock cold, also heated stock in larger sizes at a very rapid rate. By this arrangement there are practically two machines in one; that is to say, by using the regular lever, work may be turned out rapidly when the size of the stock is not so large as to make this impossible, or when the stock may be heated. For example, the machine can bend ½ in. rod cold with the regular lever without any difficulty, and heated stock can also be bent with the regular lever up to 1 in., but to bend a 1-in. rod cold it is necessary to use the auxiliary lever with the gear and ratchet arrangement.

The net weight of this machine is about 235 lb. It is secured in place by means of a socket, from which the machine may be removed when not in use. As will be noticed by the illustrations, set screws are employed for adjusting the dies to suit any thickness of stock to be bent. The dies are faced with tool steel and the lever is supported by anti-friction rollers.

Tariff Revision Hearings Beginning.

WASHINGTON, D. C., November 10, 1908.—The Ways and Means Committee to-day began a series of hearings intended to form the basis of the revision of the Dingley Tariff act, which is to be accomplished at a special session of Congress to be called soon after the adjournment of the coming short session next March. Parties interested in the metal schedule, including manufacturers, importers and dealers, will be heard November 25, 26 and 27, beginning at 9.30 in the morning of each day. These hearings were foreshadowed in this correspondence several weeks ago, but the details of the committee's programme were not formulated until after the elections on the 3d inst., and in this connection the interesting fact is disclosed that if the Republicans had failed to retain control of the House no attempt would have been made to revise the tariff at this time as it would have been impossible to pass a new law in the short session in view of the rules of the Senate, which enable two or three members of that body to conduct a practically unlimited filibuster.

The programme for the hearings beginning to-day, and which will continue until the eve of the coming short session, is as follows:

Tuesday, November 10, Schedule A—Chemicals, Oils and Paints.
Thursday, November 12, Schedule H—Spirits, Wines and Other Beverages.

Friday, November 13, Schedule F—Tobacco and manufactures of.
Monday, November 16, Schedule E—Sugar, Molasses and manufactures of.

Wednesday, November 18, Schedule G—Agricultural Products and Provisions.

Friday, November 20, Schedule D—Wood and manufactures of.
Saturday, November 21, Schedule M—Pulp, Papers and Books.

Monday, November 23, Schedule B—Earths, Earthenware and Glassware.

Wednesday, November 25, Schedule C—Metals and manufactures of.

Saturday, November 28, Schedule N—Sundries.

Monday, November 30, Schedule J—Flax, Hemp and Jute, and manufactures of.

Tuesday, December 1, Schedule I—Cotton Manufactures, and Schedule L—Silks and Silk Goods.

Wednesday, December 2, Schedule K—Wool and manufactures of.
Friday, December 4, Sections 3-34, and Miscellaneous Matters.

Hearings on articles on the free list will be held on above dates in connection with the subjects to which they most nearly relate.

The committee desires that persons wishing to be heard should apply to the clerk of the committee, W. K. Payne, before the day set for the hearing, in order to be assigned a place on the programme for that day. A person making such application should state (1) his name; (2) his permanent address; (3) his temporary address in Washington; (4) whom he represents; (5) concerning what paragraphs he desires to be heard; (6) briefly, what position he expects to advocate, and (7), how much time he wishes to occupy. He should also inclose a copy of his brief and of any documents he desires filed with the committee.

Scope of the Hearings.

Many letters and telegrams have been received by the committee inquiring as to the scope of the hearings and the particular class of information desired from those who appear for the purpose of presenting oral or written statements. The correspondent of *The Iron Age* has been at some pains to procure an authoritative statement, which may be relied upon as covering the ground comprehensively and accurately. In view of the limited time at the disposal of the committee for these hearings, it seems desirable to caution all who intend to appear to prepare themselves in advance, with a view to giving the committee the largest possible amount of real information in the shortest possible time. The committee does not desire to hear abstract discussions of principles of protection or free trade or any other academic feature of the question. It wants facts as concisely stated as possible; and, if practicable, such facts as are within the personal knowledge of the speaker. It will desire to know from each speaker whether he favors the retention of the existing provisions of law relating to the schedule in which he is interested or desires changes either in the language

of the Tariff act or rates thereof, supported in each case by a brief statement of the reasons for his position.

The committee desires especially to obtain information regarding costs of production in this country, with special reference to the item of labor and the corresponding figures for those foreign countries in which competing products are manufactured. Special attention will be paid to this item of labor cost, as it is the basic principle of the protective tariff that the protection provided shall be adequate to cover the difference in wages between this and other competing countries.

The Maximum and Minimum Plan.

Information bearing upon the maximum and minimum plan upon which the new tariff is to be based will also be sought by the committee. While Chairman Payne and his colleagues have not yet given formal consideration to this phase of the subject, it is understood that the Dingley rates as revised by the committee after these hearings will constitute the minimum or general tariff, which will be applied to the products of all countries granting to products of the United States the minimum rates of their respective tariffs. After the minimum or general tariff has been agreed upon, the so-called maximum rates will be fixed and applied to each item. These maximum rates will probably represent increases over the minimum rates of about 20 per cent. on the average—though the percentage will not be uniform in all cases—and will be levied upon the products of countries which discriminate in any way against the commerce of the United States. With regard to the maximum and minimum schedules, the committee will desire to learn the probable effect of such increases as are suggested in the way of restricting importations; also as to the probability of our being able to secure trade concessions from foreign countries on the basis of the proposed double column tariff.

It is the special desire of the committee, in view of the limited time available for these hearings, that an effort be made by the respective interests desiring to make representations to get together in advance and appoint spokesmen. Where all the interests involved in any particular schedule or paragraph can be brought to unite in a specific recommendation, it goes without saying that the work of the committee will be greatly simplified, and the probability of the adoption of the recommendation correspondingly increased. Of course, if there are conflicting interests the committee will expect to give patient hearing to all sides, bearing in mind, however, that the tariff law embraces many hundred paragraphs, and that the time to be given to any one of them must necessarily be limited.

A Revised Classification.

The committee desires it understood that at this time it has no specific bill before it, although it has obtained from various sources a large amount of information not yet digested. During the recess experts employed by the committee have gone very carefully over the text of the Dingley act with a view to improving the language where possible so as to render the classification clear, unequivocal and up to date from a technical or industrial standpoint. The decisions of the Board of General Appraisers and of the courts have been very carefully examined, and where omissions or ambiguities in the Dingley act have been discovered an attempt has been made to redraft the respective paragraphs accordingly.

Absolutely nothing has been done in the way of revising rates beyond such incidental rate revision as necessarily accompanies the fixing of appropriate classifications for unclassified or vaguely classified items. Such rates, of course, are merely those of the Dingley act, and will be subject to such changes as are suggested in the coming overhauling of the existing law. It is probable that by the time the hearings are completed this revised classification will be made public, and parties desiring to make representations after examining it in detail will be permitted to file any written suggestions that may seem desirable.

W. L. C.

In California, where many wells yield both natural gas and water, it is stated that a system has been tried whereby the gas is separated and utilized in an engine to pump the water.

The American Patent Law.—II.

Its Relation to Modern Industries.

BY JOHN D. MORGAN.*

Bearing in mind the general features of our patent law, which define its position toward inventors, and recalling further the great industrial changes that have taken place during the existence of that law, and also remembering the vast number and close relation of patents in force, let us inquire more in detail into the relation of the patent law to modern industries.

Under these modern conditions of vast investments protected in greater or less degree by patents, the protection obtained is not in all cases the same in kind as in the early and simpler days of industrial development. Circumstances and facts within the limits of the law are now laid hold of to secure protection differing essentially in nature and somewhat removed in spirit from the practice and benefits had in view by the framers of the constitution and of the early statutes. Nor is it remarkable, in view of the vast changes that have transpired, that though the law has remained the same in spirit and in its general provisions the manner of its application by the courts has changed to meet the newer requirements.

The Advent of Paper Patents.

An inventor may disclose in his application for patent merely the fruit of his intellectual effort. The law does not require that he previously shall have actually built a machine or performed a corresponding act in the other classes of invention. He is merely required to furnish a disclosure sufficient to enable those skilled in that particular art to practice the invention. It is essential for an inventor to do little except possess mental ability to work out the invention and to present it adequately by means of drawings and description to the Patent Office. This tends to remove in a very large degree any handicap resulting from lack of resources.

An inventor of limited capital, but having the requisite capacity and experience, may frequently invent and patent with but small pecuniary outlay large and important machines. If he be a man experienced in an art his patent may represent the very latest and best development and practice and have great potential value. This surely tends to "promote the progress of science and the Useful Arts." As the American law has no working requirement, and, in addition to this, the broad right of non-user has been recognized specifically by the courts, including the Supreme Court of the United States, the patentee, so far as the law is concerned, need never go any further with his invention. He has done sufficient to maintain his monopoly for the full patent period. Many have availed themselves of these conditions and these patents are known as "paper patents."

The Effect on the Industrial Arts.

Under these conditions a somewhat peculiar development has taken place. It has become a practice in certain branches of industry to utilize paper patents in maintaining upon the market a machine which has become obsolete from the standpoint of the development of the particular art. The new machine may cost less to manufacture, it may occupy less floor space, it may be less exacting in its requirements of attendance, its wear and tear may be very much less, it may be much more rapid, it may produce a superior product, or it may unite many of these advantages together with others not enumerated. Notwithstanding this, the very fact that these things have been accomplished and that for accomplishing them a monopoly for a term of years has been bestowed, backed by the authority of the Federal Government, the net result of the entire proceeding has been to render secure in its place on the market an old machine lacking these peculiar virtues of the new.

This is accomplished through control of paper patents covering the new machines by the manufacturers of the old or marketed machine. This is frequently done

by the purchase of patents from individual inventors who have worked along the lines above indicated, and frequently large concerns maintain a corps of inventors for this specific purpose. It will be seen, therefore, that in the particular instance and for the time being, the patent system is used for exactly the reverse purpose from that for which it was intended. In other words, the patents issued for improvements upon a certain machine, or for a better species of machine for doing the same thing, are kept in non-use for the purpose of allowing that machine to remain on the market from which it would be forced by the superior machines covered by the non-used patents in case they were allowed to compete with it. In its theory and literature the art has advanced, but through this very thing the practical art is held at a standstill. Nor is this result of compelling users to pay a top price for a machine not so good as the development of the art makes possible the only result, frequently the entire future development of an art is changed from what it would have been had the machines of the non-used patents been placed upon the market.

The Other View of the Situation.

On the other hand, we have no right to stop here and declare that, in view of this, paper patents are an unmitigated evil and that steps should be at once taken to uproot that evil. The revolution which has taken place in the industrial world has been outlined above. The vast sums of money necessary to launch many enterprises depending on patents has been mentioned. It is a question, therefore, whether capital would not hesitate to enter a field where it would not be assured of at least a strong probability of dominating that field for an extended period of time. If there was danger that after the factory was erected, the machinery purchased and installed, after great expenditures in special machines, tools and equipment useful in no other connection, through the eager, unrelenting inventive spirit of the age, the whole thing were rendered useless in a few years, the entire proposition would assume the complexion of speculative venture rather than of legitimate business enterprise. The returns from such an enterprise, though often liberal, seldom are such as to be attractive as mere speculations. It seems essential in such cases that the assurance of stable and foreknown conditions for a reasonable term of years is necessary in order to warrant the establishment of the industries.

This is the case with many large modern machines, the cost of production of which is prohibitive except on a basis of factory automatic or interchangeable manufacturing. It also obtains where some industry can be maintained on its present commercial footing only by being supplied with a line or series of machines used in the development of a product, the machines of the series being especially adapted to act upon the same product in various stages of manufacture as received from the machines previously acting upon it. This necessitates a factory and administration for the production of the machines equivalent to what would be required were the entire series of machines but one.

The 17 years' life of a single patent represents too brief a span for the career of such enterprises. It is only by utilizing the lives of several patents related in the same art that a longer period of monopoly sufficient to justify such enterprises can be secured. A large proportion of the paper patents so used and representing the theoretical advance of the art are produced by these very corporations, and should they through new legislation fail of the end desired, this potent means of "promoting the progress" of the arts would cease.

It is a question then whether what appeared at close range to be a perversion of the spirit and principles of the patent system is so in fact, or whether in the larger view all this does not tend to "promote the progress of science and the useful arts."

Before a final inquiry as to whether conditions ought to be changed, it might not be inapt to inquire as to what agencies are at hand to effect a change.

An inquiry as to what should be done to change this conditions of things, in case this should be thought de-

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sirable, finds its answer in the proposal (a) to enact a working requirement for all industries, (b) to enact a compulsory license law, or (c) to enact a law presenting those to the patentee as alternatives subject to his own election.

A Working Requirement.

With respect to the enactment of a working requirement, let us ask what the effect of a mere naked enactment of this kind would be. It would merely amount to requiring the expenditure of certain moneys by the owners of the patent in building a single machine, and this would be without any advantage to the trade. If the law should be framed to require a working adequate to meet the demands, it would in many lines again be a nullity for the reason that the users of machines depend rather on the advertising in trade journals and the representations of salesmen for information as to what is available in the art than on examining the files of the Patent Office. Has the ordinary user of a typewriter, a telephone, a dynamo or a planer, or any other of the marketed machines the remotest idea of what the manufacturer has by way of patents locked up in his safe. If the law went further and required an owner of patents to manufacture and advertise equally all kinds of machines covered by his patents, it would be so manifestly oppressive and unpractical as to be its own condemnation. Yet what short of this would prevent the buying up and suppression of valuable patents which are an advance in the art? Competition here is industrial warfare, and patents if of any value must necessarily sometimes be used as weapons.

Compulsory License.

As an alternative, the enactment of a compulsory license clause might be considered. In connection with this, it may be stated that such a clause is not now in force in any of the leading industrial countries. There is such a provision in the Canadian patent law, and the law is so framed that a patentee has his choice whether he shall actually work the patent in Canada or lay it open to compulsory license.

The situation of Canada is somewhat peculiar. A very large part of the consuming population of Canada is nearer to the centers of production of the United States than many parts of the United States itself. Her industrial development is also behind that of our own country, and there is doubtless a desire to interest outside capital within the country. It is sufficient here, without attempting to analyze industrial conditions in Canada to point out that those conditions are different from conditions in the United States or in Europe.

Most of the European countries have thought it advisable to enact a working requirement rather than a compulsory license requirement. The inference is fair, therefore, that they regard the working requirement as preferable to compulsory license. No detailed application of the bearing of the question of the industrial conditions in the United States and the sharp departure involved from the basic principles of our patent laws need be made in view of what has already been set out generally in connection with the consideration of the working requirement. The relation of overlapping patents to each of these, however, will be briefly considered.

In connection with all the foregoing, the bearing of the fact that overlapping patents are freely issued in the United States must not be lost sight of. The writer has personally known of patented machines which infringed a number of prior patents. One case in mind is that of a machine which when first built infringed no less than six prior patents, some of which were in commercial use and exceedingly valuable. A working requirement effective to compel a commercial exploitation of a later patent might in effect compel as well the incurrence of a number of infringement suits, or license arrangements where the later patentee would be in a poor position to negotiate a fair bargain.

Such a provision in the law would doubtless be very active in certain arts and would impose judicial and administrative duties of great volume upon some tribunal. That the Commissioner of Patents would not welcome the addition of this great burden to its already heavy duties

is beyond a doubt. Furthermore, it would involve a revolution in the theory of organization of the Patent Office. Our Patent Office up to this time has not exercised jurisdiction over any question which does not involve an application for patent pending before the office. The operation of any such provision of law might eventuate in the establishment of a central national patent tribunal, a thing which is certainly desirable for reasons totally apart from the matters under discussion.

What Would Be the Effect of Such a Law?

Such a law might operate to stay rather than "promote the progress of science and the useful arts." Under the present system the arts are certainly persistently and exhaustively developed on the intellectual—that is, the patent side, and eventually this becomes, at least in theory, the property of all. It is highly probable that were a working requirement or a compulsory license clause in force, a large corporation would have no desire to take out patents for machines other than those actually used and marketed by it.

In this connection we should consider a class of corporations which rely upon controlling or maintaining a monopoly on their product through the patents on their machines. This in itself is a legitimate use of a patent, and where the revenue is almost entirely in the sale of the product it would seem to be an injustice to compel them to yield to the demands of rivals for their machines whose ultimate object is to place the product on the market.

With reference to the domestic operation of the working requirement in Germany, the German Society for the Protection of Industrial Property has declared emphatically against the working requirement. If dissatisfaction against this requirement has arisen in a country where it has been in force for many years, and where patents do not overlap as they do here, is it likely that the industrial elements in this country would encourage the enactment of such a requirement after experiencing the exceedingly liberal treatment accorded by our present laws?

The Right of Non-User.

This right under the law as it stands has been most clearly stated by the Supreme Court. In the telephone cases this court said:

Counsel seem to argue that one who has made an invention and thereupon applies for a patent therefor occupies, as it were, the position of a *quasi* trustee for the public; that he is under a sort of moral obligation to see that the public acquires the right to the free use of that invention as soon as is conveniently possible. We dissent entirely from the thought thus urged. The inventor is one who has discovered something of value. It is his absolute property. He may withhold a knowledge of it from the public, and he may insist upon all the advantages and benefits which the statute promises to him who discloses to the public his invention.

A few years later, upon this point, the same court said:

If he [a patentee] sees fit, he may reserve to himself the exclusive use of the invention or discovery. If he will neither use his device nor permit others to use it, he has but suppressed his own. . . . his title is exclusive, and so clearly within the constitutional provisions in respect to private property that he is neither bound to use his discovery himself nor permit others to use it.

Within the last few months this same question came up before the court in a modified form. It was contended in this case that the right of nonuser was exercised in a perverse spirit, and for the sake of forcing on buyers an old type of machine through nonuser of the patents of the superior machine, which patents were held by the manufacturers of the old and inferior machine. The manufacturers of this old and inferior machine sued a concern putting on the market a new machine which infringed the suppressed patent. It was merely contended in this defense that the plaintiffs were not entitled to an injunction, but only to their legal remedy of damages. In other words, in standing upon their legal rights without being in the equitable position, they were entitled only to legal remedies and not to equitable remedies. Justice Kenna, in delivering the opinion of the Supreme Court in June last, said:

But, granting all this, it is certainly disputable that the nonuse was unreasonable, or that the rights of the public were involved. There was no question of a diminished supply or of increase of prices, and can it be said, as a matter of law, that a nonuse was unreasonable which had for its motive the saving of the expense that would have been involved by changing the equipment of a factory from one set of machines to another? And even if the old machines could have been altered, the expense would have been considerable. As to the suggestion that competitors were excluded from the use of the new patent, we answer that such exclusion may be said to have been of the very essence of the right conferred by the patent, as it is the privilege of any owner of property to use or not use it without question of motive.

As possibly having some bearing upon any attempted change in the present law, so clearly construed by the highest judicial authority, as above outlined, the following dictum of Justice Kenna in the case just mentioned is not without interest:

And another fact may be mentioned. In some foreign countries the right granted to an inventor is affected by non-use. This policy, we must assume, Congress has not been ignorant of nor of its effects. It has, nevertheless, selected another policy; it has continued that policy through many years. We may assume that experience has demonstrated its wisdom and beneficial effect upon the arts and sciences.

Direct Taxation of Patents.

All of the prominent European countries impose a tax directly upon all patents, usually in the form of an annuity and imposing as a penalty forfeiture or lapsing of the patent. In France and Germany, this provision is concomitant with a working requirement, and viewed from the liberal standpoint of the American law almost takes on the appearance of harshness. That these two provisions of the law co-exist might be taken to indicate that the tax was imposed principally for purposes of revenue.

From the standpoint of giving the best possible bargain to the inventor, which may be generally stated as the standpoint of the American Government, let us inquire what the effect of direct taxation would be. Individual inventors frequently have difficulty in interesting capital, and sometimes years elapse before an invention is gotten under way. It is just possible that in many cases the imposition of the annual tax with the forfeiture penalty attached would act to deprive the inventor of the fruits of his frequently lifelong labor. On the other hand, if the law were intended to step the bolstering up of a machine on the market by paper patents on improvements, there can be no doubt that in important cases the tax would be a mere bagatelle from the standpoint of the manufacturers and would be scrupulously paid. In fact, it might not unreasonably be held that such a tax is a deliberate price placed on non-user and be used to reinforce the practices that it was aimed at.

Where a patent is commercially exploited, the income from taxation upon machines and product is frequently large. It would seem, in a general way at least, that indirect taxation is better adapted to measure the success of an invention and the just liabilities of its owners to participate in the common support of the Government.

Nature of the Question.

The question is essentially one of industrial economics and should be decided on this basis. Any provision of this kind must, in view of what has been shown and especially in view of the decisions quoted, be regarded as a limitation of the rights now accorded inventors and a narrowing of the liberal spirit which now pervades the patent laws. That the operation of the present laws in their entirety has been a notable success, none can doubt. Whether any change is desirable should be very carefully considered.

So far as any modification of the law to meet legislation abroad which adversely affects American interests, such change should be considered separate and apart from the domestic situation.

History must always put down the last half century as one of the notable periods of world development and must also accord to the United States a prominent place in that development. From our present viewpoint, furthermore, our patent laws must be recognized as one of the potent agencies in this great development.

(Conclusion.)

The Latest Almond Drill Chuck.

The new inclosed pinion drill chuck made by the T. R. Almond Mfg. Company, Ashburnham, Mass., differs from the form which has been the standard with that company for 30 years only in the manner of tightening, a square ended key being used instead of a spanner. One particular advantage of the new arrangement is that it is unnecessary to hold the spindle from revolving while tightening the jaws. On sensitive drills this is particularly desirable.

The body of the chuck is recessed to receive a bevel pinion which meshes with teeth cut on the face of the jaw actuating nut. The pressure on the nut being on the back, the same wearing surface is preserved as in the Almond spanner operated chuck. A cap covers the pinion and provides a support for the outer end of it, while the inner end of the pinion has a bearing in the body of the



The New Inclosed Pinion Drill Chuck Made by the T. R. Almond Mfg. Company, Ashburnham, Mass.

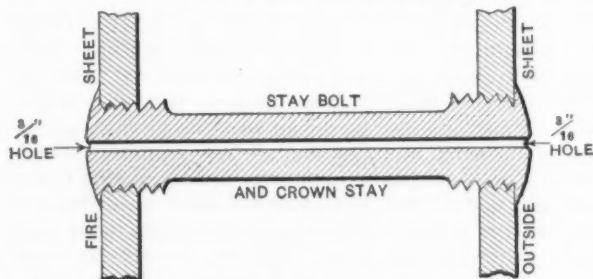
chuck. Both the pinion and the nut are made of a special grade of tool steel tempered. There are no projections on the chuck; the pinion comes flush with the surface of the chuck body and has a square hole in it to receive the key. The knurled sleeve can, as formerly, be used for quick adjustments by hand, while the key is used for the final tightening.

The Almond inclosed pinion chuck is made in three sizes. No. 1 has a capacity from zero up to 3-16 in.; No. 2, zero to 5-16 in., and No. 3, zero to 1/2 in. Like the Almond standard drill chuck, it has jaw holes open at their ends. This construction incidentally facilitates lubricating, but it is principally to enable making the holes with a finer finish and of exactly uniform diameter end to end to give a perfect fit and perfect bearing to the jaws.

The Fort Wayne Engineering & Mfg. Company, Fort Wayne, Ind., which was organized and incorporated six months ago with \$200,000 capital stock, to manufacture engines and boilers, has built a few engines which will be tested out inside of this year, the plans for future building depending on the outcome of these tests. All the work done so far has been preliminary. The president of the company is Henry C. Paul; secretary-treasurer, James H. Haberly; chief engineer, John Astrom.

Falls Hollow Staybolt Iron.

Even though it has been on the market for some time the extensive use which is being made of hollow staybolt iron makes it seem desirable to explain something of its manufacture, characteristics and advantages for the benefit of those who may not be familiar with it. An



A Safety Staybolt and Crown Stay as Made by the Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio.

interesting vibratory test of the material as manufactured by the Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, was made recently at Purdue University. Eight samples were tested with the following results:

No.	Tension load. Pounds per square inch.	Revolutions per minute.	Number of revolutions to rupture.
1.....	4,000	100	10,188
2.....	4,000	100	13,123
3.....	4,000	100	8,339
4.....	4,000	100	9,363
5.....	4,000	100	8,868
6.....	4,000	100	10,880
7.....	4,000	100	11,888
8.....	4,000	100	5,318

Average..... 9,746

The tests were made on an Olsen staybolt machine in accordance with the specifications recommended by the Committee on Staybolts of the American Society of Testing Materials. These specifications require a tensile strength of not less than 48,000 lb. per square inch, with an elongation in 8 in. of not less than 28 per cent. and a contraction of area of not less than 45 per cent., and an ability to stand 6000 revolutions when one end is fixed and the other end (8 in. from the fixed end) is moved in a circle of 3-32 in. radius, while the bolt is under a tension load of 4000 lb.

Falls hollow staybolt iron is made from a blend of imported Swedish and native high grade iron stock, the combination of which is claimed to produce the best staybolt material. By the use of it a saving of labor and material is effected in application and renewals, as a hollow bar can be threaded its full length, screwed in the firebox, the proper length cut off, and the operation continued until the entire bar is used up. Hence, there is very little, if any, waste. In removing a broken hollow bolt, the operator has a hole exactly in the center of the bolt for his drill to follow, and nothing but the bolt is removed. On the other hand, in removing broken hollow stays with telltale holes drilled in the ends, which holes are often drilled away from the center, and sometimes through the surface of the bolt, it frequently happens that considerable of the sheet is mutilated, necessitating the reaming out of the sheet and the replacing of the bolt with one several sizes larger in diameter.

The drilling of the telltale holes in solid stays weakens the bolts at the vital point by cutting the interior fiber of the iron, and causes them to break much quicker than they otherwise would were they not drilled. The telltale in the hollow bolt is rolled through its entire length in the process of manufacture, as shown in the illustration, therefore its length is uniform throughout; no one point is weaker than another. The hollow bolt is rolled inside as well as outside, making it dense and compact, and able to withstand the unequal expansions and contractions of the firebox sheets much longer than solid bolts.

The telltale holes drilled in solid stays are likely to become clogged, and so fail to indicate a fractured bolt by the escape of steam. The telltale hole in the hollow bolt being rolled in it from end to end is kept clear by the current of air passing through it into the firebox.

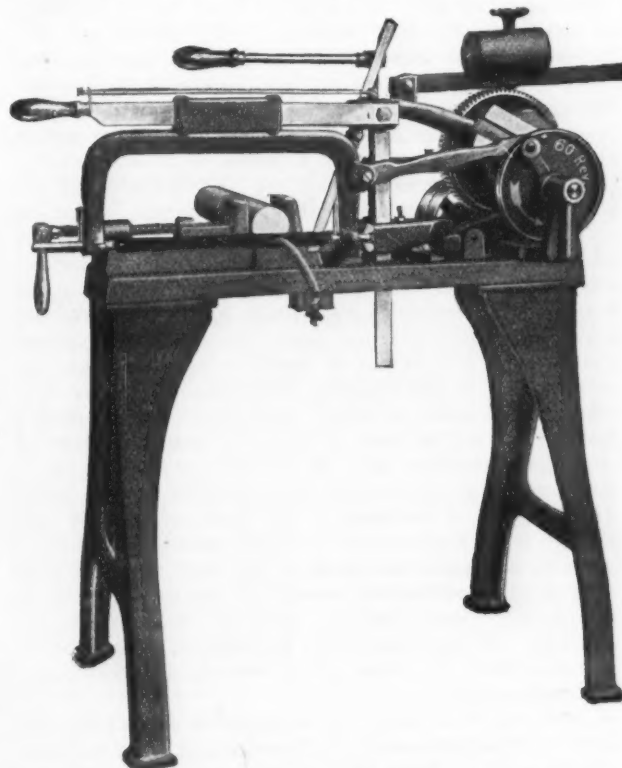
Incidentally this air current aids the combustion of fuel, reduces the temperature of the bolt, prevents undue expansion and contraction and protects the inner ends of the stays from burning and the side sheets cracking.

Many of the leading railroads in all parts of the world are now using hollow iron exclusively for repairs, and in new equipment it is largely employed for the short stays, crown stays and even the braces.

The advantages of the hollow bolt make it safe and economical to use for the staying of modern high pressure locomotive, marine and stationary boilers. The material is made in average lengths of from 8 to 10 ft., and in outside diameters from $\frac{7}{8}$ to $2\frac{1}{2}$ in. and inside diameters of $\frac{1}{8}$ to $\frac{3}{4}$ in. The larger sizes are suitable for use as hollow shafting, mining drills, thawing points and other special uses requiring high grade material.

A New Milford Power Hack Saw.

The power hack saw shown in the illustration, known as the Milford No. 4, is built by the Henry G. Thompson & Son Company, New Haven, Conn. It contains several new features, notable among them being a gear drive and a quick return motion of the saw in combination with a mechanism for raising the blade during the reverse stroke. The movement of a slotted cam gives these motions. While the cut is at the standard rate of 40 strokes the return has just twice that speed, or at the rate of 80



The No. 4 Milford Power Hack Saw Made by the Henry G. Thompson & Son Company, New Haven, Conn.

strokes. The machine is geared 4 to 1. This method of drive does away with the usually large pulley and makes unnecessary the use of a small pulley on the line shaft. The quick return effects a marked saving in time, and the lifting of the saw free of the work saves the blade.

The cutting capacity of the machine is 5 x 5 in. The blades used may be 10, 11 or 12 in. long. The tight and loose pulleys are 6 in. in diameter by $1\frac{1}{2}$ in. face. The gears are machine cut, and there is adjustment for wear wherever necessary. Its floor space is 20 x 40 in. and weight 200 lb. Under test this machine made 33 cuts through a piece of unannealed Jessup steel 1 x 2 in. in an average time of 6.84 min. each.

The first six of the series of movable dams projected for the upper Ohio River are now in operation. With the completion recently of Nos. 2 and 3 of the fixed dams on the Allegheny River, Pittsburgh now has slack water for 128 miles up the Monongahela River, 25 miles up the Allegheny and 29 miles down the Ohio.

Foundry Accounting Methods.*

BY JOHN DOUGHTON, PHILADELPHIA, PA.

While the subject of this paper is very comprehensive, covering nearly every element connected with the recording of foundry detail, I shall take up but one phase of the subject, that to my knowledge has received but very little attention. I refer to the proper handling of customers' orders. I suppose that nearly everybody in the foundry business, especially those who come in close touch with the customer, has felt at some time the need of an effective method for handling customers' orders through the foundry so as to be able to give more satisfactory deliveries, and thus prevent a great deal of complaining on the part of the customer—some method by which, if a customer asked when he could get his castings, he could be given a date that could be realized without upsetting all the previously made plans of the foundry; or, if he did not ask for any promise of shipment, the castings would be delivered to him without the necessity of his calling our further attention to the order. Any arrangement that will enable a foundryman to accomplish this should have his careful attention.

Little Attention Paid to the Order in Which Work Is Received.

Every foundryman is aware of the importance of prompt deliveries in his efforts to secure orders, but how often, after an order has been received on the strength of certain promises of delivery, it is neglected or forgotten as far as any attempt to meet the promises are concerned. Many orders are lost because a prospective customer is not satisfied that his orders will receive proper attention, or else believes they will receive better attention by the foundryman to whom he gives the order.

In many foundries castings are made without any regard to the order in which they are wanted. When an order is received from a customer it is duly entered and the patterns are placed on a shelf in the foundry, and unless the customer has specified when he must have the castings, the patterns may remain on the shelf for almost any length of time, until the customer inquires about them. Now it may be that this same customer has other orders in the foundry. Does that fact have any effect on the order in which the castings will be made? Not at all. If the last pattern is a desirable class of work and calculated to swell the heat or tonnage, in it goes, crowding out castings less desirable for the foundry, but just as necessary to the customer. If the last pattern is an intricate or otherwise undesirable class of work it is allowed to remain on the shelf together with a lot of other undesirable work that has been allowed to accumulate. Some day the customer inquires for the castings, and then some story is invented to pacify him, and everything is turned upside down in an effort to get the castings out.

This neglected work so accumulates that, when the day of reckoning comes, the foundry has a lot of undesirable work on hand that all customers are calling for at the same time. This is not only a possible condition, but one that has been seen time and again. Very often the failure to make castings on time is blamed on the foreman, though nothing is done to assist him in knowing the order in which they should be made. The greatest harm this practice does is that some customers are receiving castings that they could well wait for, while other customers get practically nothing and are forced to wait for castings on which they may have allowed sufficient time had the foundry used some discretion and a little diligence in the filling of the order.

Accumulation of Partly Filled Orders.

Another source of annoyance to the foundry, as well as the customer, is the accumulation of old orders that need cleaning up, some only half filled, but most of them needing but a few castings to complete the order. The reason for this accumulation of back orders is often found in the lack of proper provision for the discovery and replacing of defective castings. One result of this lack of proper methods is that one day this customer is

complaining about neglected orders, and the next day it is some other customer, so that in an effort to keep them all satisfied the foundry is kept in a continuous turmoil, often resulting in bad castings and bad tempers. Another disastrous result is that the customer becomes dissatisfied and is ready to change foundries regardless of price, provided he can be made to feel that his orders will receive better attention.

By the adoption of a simple follow up system in connection with the orders all this trouble and confusion could be avoided. It must be remembered that labor in the foundry differs from other labor in this, that while the machinist or other workman sees the product of his labor continually and can replace any material found defective or is spoiled by him, the molder on the other hand does not see the product of his labor until the end of the day, or it may be after many days. A molder may complete the molding on an order, but we are far from

FOUNDRY LAYOUT SHEET											
MONTH	DAY	MOLDER <i>J. Brown</i>				MOLDER <i>J. Smith</i>				MOLD	
		ORDER	PAT.	PCS.	HRB.	ORDER	PAT.	PCS.	HRB.	ORDER	PAT.
Nov.	2	4820	B1	2	10	4821	C-2	2	6		
							C-3	2	4		
	3										
	4	4820	B1	2	10	4821	C-2	2	6		
							C-3	2	4		
	5	4820	B1	2	10	4821	C-2	2	6		
							C-3	2	4		
	6										
	7	4820	B1	2	10	4821	C-2	2	6		
							C-3	2	4		
	9	4820	B1	2	10	4821	C-2	2	6		
							C-3	2	4		
	10										
	11	4820	B1	2	10	4821	C-2	2	6		
							C-3	2	4		

Fig. 1.—Foundry Layout Sheet.

being certain that we shall have all the castings. This feature of the foundry business (the inability of the molder to see the product of his labor and his consequent inability to discover and rectify his mistakes during the progress of his work) is responsible for a great many of the troubles of the foundryman.

There are various order systems in use in the foundry business, probably very few foundries using the same scheme. Some of these systems are models of record keeping and make good histories of operations in the foundry, but they don't give much assistance toward filling orders with any regard to the customers' interests. By some of them it is necessary for the foundry foreman to act the part of a clerk and to spend a great deal of time going over orders that might be given to looking after the quality of work being turned out by his men. Nearly all lack any provision for handling the work with any regard to the order in which it is wanted.

A Follow-Up System Necessary.

In looking for a solution of this problem, let us notice for a moment the methods used by an up to date pur-

* Read before the Philadelphia Foundrymen's Association, October, 1908.

chasing agent for a large plant. When he places an order for any material, the first thing he usually does is to set a date upon which he will look for shipment; he bases this date either on promises made by the shipper or on his expectations of delivery. Now it would be practically impossible for him to go over the purchase orders each day and select those needing attention, so he

DAILY WORK SHEET					
NOVEMBER 2 1908					
MOLDER	ORDER	PAT.	PCS.	ORDER	FAT.
J. Brown	4820	B 1	2		
J. Smith	4821	C-2	2		
		C-3	2		

Fig. 2.—Daily Work Sheet.

"tickles" this particular order for attention on a certain date, and when that date comes round he takes out this order and any others that may have been tickled for the same date and gives them all the necessary attention. If any require still further attention he fixes the date and again tickles the order as before, allowing none to be put away if unfilled without being scheduled for future attention. By this method each purchase order is looked after systematically. By precisely the same method we can look after all foundry orders.

I shall not go into details of making out foundry orders, but will describe an automatic follow-up system for following up orders systematically until every item called for on the order has been delivered. This plan consists of laying out the work as fast as orders are received, assigning each pattern to a certain molder to be made on a certain day and basing the completion of the order on the amount of work each molder has ahead of him. Each order is tickled or scheduled to be looked up on certain dates and all delinquencies are immediately reported and attention given them. In other words, the foundry is operated according to a schedule. By this plan three forms or sheets are required. The first I shall call a foundry layout sheet, the second the daily work sheet and the third the promise sheet.

The Foundry Layout Sheet.

The foundry layout sheet, as shown in Fig. 1, is a sheet ruled horizontally and in columns, each column representing a molder or molding floor. The spaces between the horizontal lines represent working days. The lines are far enough apart to allow sufficient room for inserting four or five pattern numbers. When an order is received, the foundry order is made out in the usual way, the foreman or other qualified person indicating on each pattern the time required to mold it, the number of pieces he will make each day and the molder who will make the castings. The order clerk will then mark on the foundry layout sheet in the proper columns, according to the name of the molder, in the first space, the number of the pattern and the number of pieces to be made each day, also the time it will require the molder to spend each day to make the castings. He will carry this down until the total number of castings required is entered on the sheet, noting the date the order will be completed; this date he marks on the order as a record of when the castings are expected to be completed.

To illustrate: We receive an order for 20 castings from pattern B-1. The foreman indicates on the pattern that it will require 5 hr. for each casting, and names J. Brown as the molder; consequently 10 working days

must elapse before the order is completed. We turn to the foundry layout sheet and in the column allotted to J. Brown we enter the 20 castings. Assuming the order is received on the first day of the month and is the first order, we enter two castings for the first day, two for the next and so on until the entire order of 20 castings will be completed on the twelfth day, which date we mark on the order.

This illustration is a very simple one, and I will give another not quite so simple. We receive an order for 10 castings C-2 and 20 castings C-3. The foreman says that it will require 3 hr. to make each of the first and 2 hr. for each of the second, and two of each will be made per day, and he gives the job to J. Smith. In the column allotted to Smith we enter two castings C-2 at 3 hr. each, making 6 hr., and two castings C-3 at 2 hr. each, making 4 hr., a total of 10 hr. You will note, however, that while the 10 castings, C-2, will be completed on the 6th, the 20 castings, C-3, will not be completed until the 12th. This information is entered on the order opposite each item. You will note also that while this man has a full day's work before him for the first five days, he has only 4 hr. of the next five days, so that, as the orders come in, we must fill in these days with work he is capable of handling.

This layout sheet when filled in as the orders are received will show, first, what work is assigned to each molder and the probable length of time it will take him to complete it, and, second, by referring to any certain date we can see what work is laid out for that day.

The Daily Work Sheet.

The next step is to let the molder know in a convenient way what he is to make. For this purpose we use the daily work sheet, as shown in Fig. 2. This is a

TICKLER SHEET							
NOVEMBER							
DATE	ORDER	ORDER	ORDER	ORDER	ORDER	ORDER	ORDER
2							
3							
4							
5							
6	4821						
7							
9							
10							
11							
12	4820	4821					
13							

Fig. 3.—Promise or Tickler Sheet.

sheet ruled horizontally, each space representing a molder or molding floor. To the left is entered the name of the molder and opposite his name is entered the patterns he is to work on and the number of pieces he is to make that particular day. This is made up from the foundry layout sheet and should be made up the day before, so as to be ready for the molder in the morning. It

should be posted in a convenient place so as to be seen by all the molders. It is a simple matter for the pattern carrier to use this sheet in getting patterns out for the molders.

The difference between the foundry layout sheet and the daily work sheet is that the daily work sheet shows only the work laid out for one day and does not show the time assigned to any job. Our system so far has provided us with a means of knowing what to expect; the next step is to know if our expectations have been fulfilled, and it becomes necessary for us to follow up each order systematically. As stated before, the date upon which we expect the complete order is entered on the copy of the order, so that by reference at any time to any order we may know when it is expected to be completed.

The Promise or Tickler Sheet.

We now take the copies of the orders and enter the number of the order on the promise or tickler sheet opposite the date the order is to be completed. This promise sheet, as shown in Fig. 3, consists of a sheet ruled vertically and horizontally so as to leave room for the number of an order or pattern in each space. On the left of the sheet we list the days of the month, omitting Sundays, allowing as many lines as may be thought necessary to each day. Opposite the respective dates we place the number of the orders according to the date they are to be completed, so that by turning to any one day we have a list of the orders scheduled for completion on that date.

As each day comes round, we look up the orders that were to be completed that day. If shipment is made as laid out nothing more need be done, but where shipment is not made we must get after all such orders, obtaining new dates on which shipment will be made and entering them on the tickler sheet. When it is impossible to keep a promise made to a customer he should be notified of the change, as it may mean a great deal to him in the preparations he is making. This will often forestall complaints and will create the impression in the minds of some customers that their interests have not been ignored altogether.

The successful use of the foundry layout and daily work sheet depends largely on the manner in which the promise or tickler sheet is checked up. It should be the duty of some one each morning to check the shipments of the day before. To do this, it is only necessary to take those orders opposite a certain date and see if they have been completed as scheduled, reporting on a special form any orders not completed. It would also be well to send to the shipping clerk a list of all orders promised for completion on the following day. This will give him an opportunity to get those castings ready.

The automatic feature of the promise or tickler sheet lies in the fact that the following up of an order does not depend on somebody's memory or on a memorandum that is often lost. When an order is received, the date we expect to complete it or the date on which we have promised a shipment is entered on the order and the order number is entered opposite the proper date on the promise sheet. Thus at the proper time this order is brought to our notice, and if the castings were delivered it requires no further attention, but if for any reason shipment was not made we look the matter up, not allowing the matter to rest until we have tickled the order for future attention.

While I have spoken of tickling an order according to the date we expect to complete it, there is no reason why we should not enter the dates on which we expect to make partial shipment, if this is desirable. To sum up the whole matter, the foundry layout sheet is for the purpose of assisting the foundry in making castings in the order they are required, while the promise sheet is to assist the office in following up the foundry and reporting any delinquency as soon as it occurs.

Rush Orders and Defective Castings.

There is one phase of this subject that has not yet been touched. In order that our system shall work successfully as it is now laid out, it would be necessary that we receive no rush orders, that everybody be willing to

wait his turn and also that we have no defective castings. But these are conditions that are not likely to exist at any time in the foundry business. Customers will send orders for castings that are wanted at once, or are wanted before our ordinary routine would give them the castings, and also the foundry will continue to make defective castings.

To provide for rush orders and the replacing of defective castings, it will be necessary for us to allow sufficient time each week to take care of them. This time will depend on the conditions existing in each foundry; so, if it is found that it requires one full day a week to take care of rush orders and defective castings, we skip one day each week and we lay out the work on the foundry layout sheet, or perhaps it may be best to skip two half days each week. For instance, it may be found from experience in one foundry that it requires nearly two days each week to handle this class of work, so that Tuesdays and Fridays of each week may be allotted to the filling of rush orders and replacing of defective castings. No work is assigned to these days from the orders as they are received, unless it be for castings that are wanted at once.

While the work for these two days is made up of rush orders and replacing defective castings, it is not to be understood as meaning that defective castings cannot be replaced or rush orders filled on any but these two days. Any system to be of real service must be somewhat elastic in its operation. If a rush order is received we do as we do now, crowd it in to the best advantage, and here is where the value of our methods appear. Usually in crowding a rush order in something else is crowded out, and is often allowed to remain out, but we only crowd it along, not out, and as we have allowed the necessary time in the layout of our orders, no previously made plans are upset in our effort to get this rush order out. In entering this rush order on the foundry layout sheet we observe the same rules as in regular work, so as to know as nearly as possible the time to which work has been assigned. As replace orders are to be considered as rush orders, the same remarks apply to the replacing of defective castings as to the filling of rush orders. It sometimes happens that the foreman underestimates the time required on a given job; he will also overestimate on others, so that his estimates if made intelligently will balance up fairly well.

Advantages of the System.

The advantages to come from a system such as I have outlined are as follows: The foreman can know at any time how much work and what work is allotted to any molder by referring to the layout sheet. As each pattern as it is received is assigned to a workman, the foreman does not have to be hunting work for his men, but can give his time and attention to more important work, the proper running of the foundry and to the quality of work being turned out. By reference to the order we have the expected date of completion. By referring to any date in the tickler sheet we have a list of orders scheduled for completion on that date. As every order is scheduled to receive attention according to the needs of the customer or according to our expectations of shipping the castings, it can readily be seen that every order will receive due attention at the proper time, thus making it unnecessary for some one to go over the order book and list those orders that seem to be neglected. I say "seem to be" because without a very intimate knowledge of the conditions in the foundry the officeman cannot know whether an order is unfilled because of neglect or otherwise, and often he is looking up and hurrying up orders that are already receiving proper attention, while paying no attention to other orders that have gone to sleep.

It is unnecessary for me to call attention to the advantages of such a system to the buyer of castings or the advantage to the foundry in satisfied customers. By the methods here only outlined, it is possible to lay out the molding and shipping on castings of every size and weight regardless of the number of pieces wanted, the molding to cover a period of one day or two or three months or more if necessary, with the practical certainty that each piece will be molded, cast, cleaned and shipped on schedule

time, including the filling of rush orders and the replacing of defective castings.

Certain modifications of this plan might be used effectively, eliminating certain features in some cases and adding in other cases as necessity required. I can conceive of a plan where the payroll and cost system could be handled in connection with the system hereoutlined to good advantage.

There are many subjects connected with the handling of the orders that I have not touched upon, as, for instance, the handling of patterns, the handling of castings from the molding floor to the customer, the discovery of defective castings, simple accounting methods and many other subjects that suggest themselves. These all go toward making an effective system for giving prompt and satisfactory service. The difficulty with some systems is the subserviency of the foundry to the system, whereas the reverse should prevail, and the system be made to serve the needs of the foundry and the interests of its customers.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held in the Manufacturers' Club on the evening of November 4, with President Thomas Devlin in the chair. The Mt. Penn Stove Works, Reading, Pa., represented by Wm. R. Schaeffer, was elected to active membership. Memorial resolutions on the death of Walter E. Devlin, president of the Philadelphia Hardware & Malleable Iron Company, were presented by the committee and were ordered spread on the minutes of the association.

It was decided that a committee of three, to be named by the president, be appointed to represent the association at the meeting of the Atlantic Deeper Water Ways Association, which will hold its second convention in Baltimore, Md., November 17 to 19. The appointment of the committee was deferred.

The paper before the meeting was on "Foundry Accounting Methods," by John Doughton, Philadelphia. Considerable discussion followed the reading of the paper. It was the general opinion that Mr. Doughton's methods, adjusted and adapted to various needs, according to the character of work done in the different plants, was a step forward in this important work. After adjournment luncheon was served in the dining room of the club.

Lake Superior Ore Shipments in October.

The comparative statement of Lake Superior iron ore shipments to November 1, 1908, and November 1, 1907, by ports is as follows in gross tons:

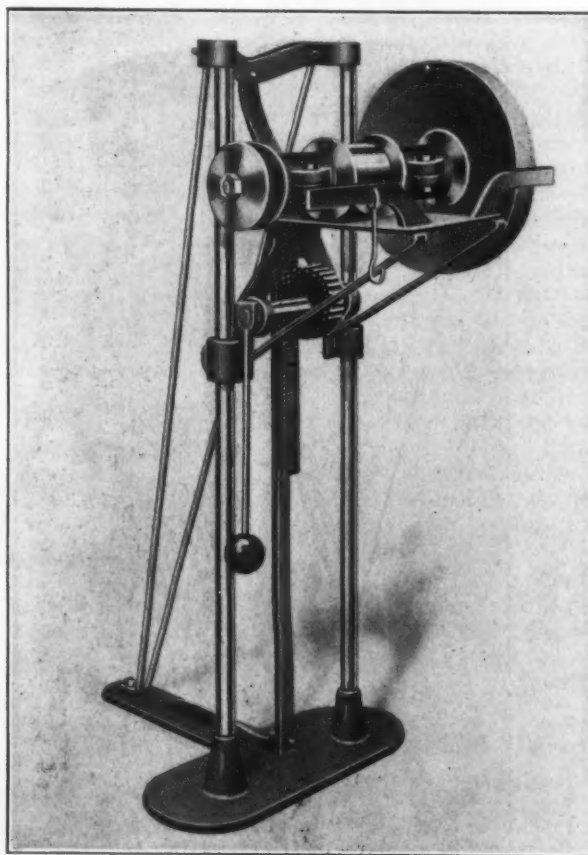
	To November 1, 1908.	To November 1, 1907.
Escanaba	2,746,116	5,253,043
Marquette	1,177,730	2,701,812
Ashland	2,019,948	3,103,838
Superior	2,908,619	6,747,945
Duluth	7,931,568	11,908,539
Two Harbors	4,946,091	7,326,684
Totals	21,730,072	37,041,861

The November movement is not expected to exceed 4,000,000 tons and may be several hundred thousand tons less. The situation differs from that of last year and the year previous, in that some belated demand for ore made its appearance this year, while in the two years previous the shipping schedules were well made up in October. The November movement last year was 4,156,076 tons, while in 1906 it was 3,734,167 tons. The shipments from Escanaba, Marquette and Superior this year have been a smaller percentage of the total than these ports contributed last year. Ashland shows a small percentage increase, while the percentage contributed by Two Harbors and Duluth, representing Mesaba ore shipments, increased from 51.91 last year to November 1 to 59.26 this year. The Superior percentage fell from 18.20 to 13.38, indicating that the Hill and other properties shipping by the Great Northern have not been as extensively worked.

The Economy Emery Wheel Stand.

Elimination of the countershaft usually required to drive such machines and economy in cost and maintenance are the leading features of a new emery wheel stand brought out by George E. Soper, Kankakee, Ill. The stand is of unusual design in that it is arranged for direct belt connection with the line shaft or motor. Mounted on two upright posts, to which it is secured by bolted clamp collars, is the arbor frame. This carries a two-wheel spindle in the center of which is the driving pulley.

Just back of the arbor frame is a toothed rack attached to a post rising from the base, into which meshes a spur gear pinioned in the lower part of the frame. The gear is rotated by a ball lever which raises and lowers the arbor frame and so loosens or tightens the belt. This mechanism takes the place of tight and loose pulleys since when the lever is raised the belt runs idle in the frame. It also affords instant means of tightening



The Economy Emery Wheel Stand Made by George E. Soper, Kankakee, Ill.

the belt to any required tension and prevents slipping, thereby insuring the full cutting capacity of the wheel.

A feature of construction that contributes to the rigidity of the spindle bearings is the casting of the top half of the arbor bearings solid with the frame. This brings the pull of the belt against the frame itself instead of on cap screws, which are in this case only required to carry the weight of the arbor when idle. When not in use the ball lever is raised and is held by a swinging hook provided for that purpose.

In addition to an adjustable tool rest for each wheel the stand is supplied with a surfacing attachment perpendicularly adjustable to fit wheels of any size from 6 to 12 in. in diameter. The machine is rigidly braced to withstand vibration and sets on a solid cast base. Wheels from $\frac{3}{4}$ x 6 in. to 2 x 12 in. set 14 in. apart are accommodated on the arbor shaft, which also carries a $3\frac{1}{4}$ x $3\frac{1}{4}$ in. flange pulley.

Reports that the American Sheet & Tin Plate Company would erect more hot mills at its New Castle, Pa., plant are officially denied.

The L. L. Scott Gasoline Rock Drill.

Three types of gasoline rock drills have been invented and built by L. L. Scott of Joplin, Mo., namely, the double-acting hammer type, single-acting hammer type stope drill weighing 90 lb., and a double-acting piston type drill. The latter type is illustrated herewith. The engines on all of these drills work on the two-cycle principle. One of the early types of drill was demonstrated at the American Mining Congress last year and aroused considerable attention.

Experience has indicated that a practical piston gasoline rock drill should fulfill the following requirements: It should afford an impulse on every up and every down stroke (a powerful up stroke is required for drilling holes as deep as 10 to 30 ft. on account of weight of steel to be lifted and the tendency for the steel to hang in the

piston. The drill rod is swivelly connected to the piston and is free to rotate independently of the piston, as shown in Fig. 2. The rotating device is located in the lower charge receiving chamber. The crankshaft is cushioned to relieve the bearings of jar when the bit strikes the rock. The pistons are acted on by 300 lb. explosive pressure, and are practically free from the crankshaft when the bit strikes the rock. This gives the result of a free piston, at the same time the crank acts as a guide to insure the proper port opening, keeps the piston from knocking out a head, if a pocket is struck in the rock, and is a means of starting the drill. The piston has the usual U bolt chuck for holding the steel. All parts are oiled automatically by oil that is mixed with the gasoline drawn in with each suction of the engine. The drill, as a whole, permits a rigid construction and is remarkably simple. Common rock drill mountings

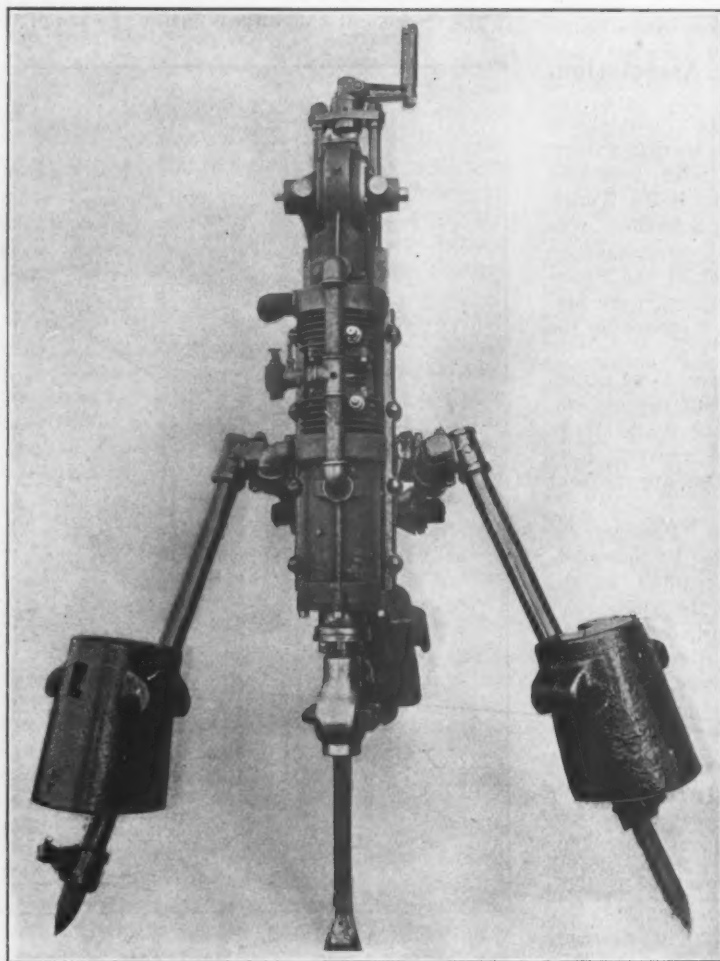


Fig. 1.—A Double Acting Piston Type Gasoline Rock Drill Designed by L. L. Scott, Joplin, Mo.

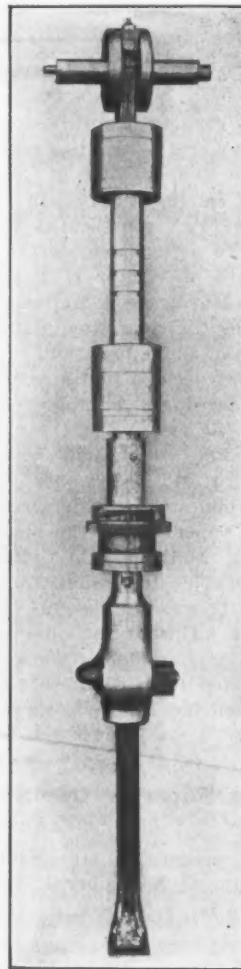


Fig. 2.—Piston and Drill Rod Removed.

hole); the working parts should be entirely inclosed water tight; the drill should be light enough for two men to handle it easily; the piston should be a solid piece of steel and yieldingly connected to the crank shaft, and the drill should have no valves, gears, push rods, cams, or other delicate parts that would not stand the hard use to which it is inevitably subjected.

The drill illustrated in Fig. 1, was built with these considerations in view. It is as compact as an air drill, and its weight is only 174 lb. It will drill 3 in. per minute in hard granite, and consume only $\frac{1}{8}$ gal. of gasoline in 15 min. when doing hard drilling. This type of drill is adapted for deep holes from 10 to 30 ft. deep, while the small hammer type will drill shallow holes equally as fast with half the amount of gasoline. Briefly, the drill is a unique type of double-acting two-cycle gas engine. The charges are drawn in at the upper and lower ends of the drill through ports; are compressed and passed to the central part of the drill, where they are exploded alternately, one for the up and the other for the down stroke, and act on the inner faces of the

are used to support the drill, in connection with the usual feed screw for feeding the drill into the rock.

The piston, piston rod and chuck are nickel steel forgings; the cylinders are semisteel castings; the cylinder heads, malleable iron castings; crank shaft, nickel steel; bearings and connecting rod, bronze; rotating device, forged steel and tool steel, and all parts are made strong enough to suit the power of the drill. Allen metal is used as metallic packing between the two explosive chambers, and will stand a temperature of 1500 degrees. The head joining the explosive chamber is made in halves, and the joint is hand scraped on a surface plate.

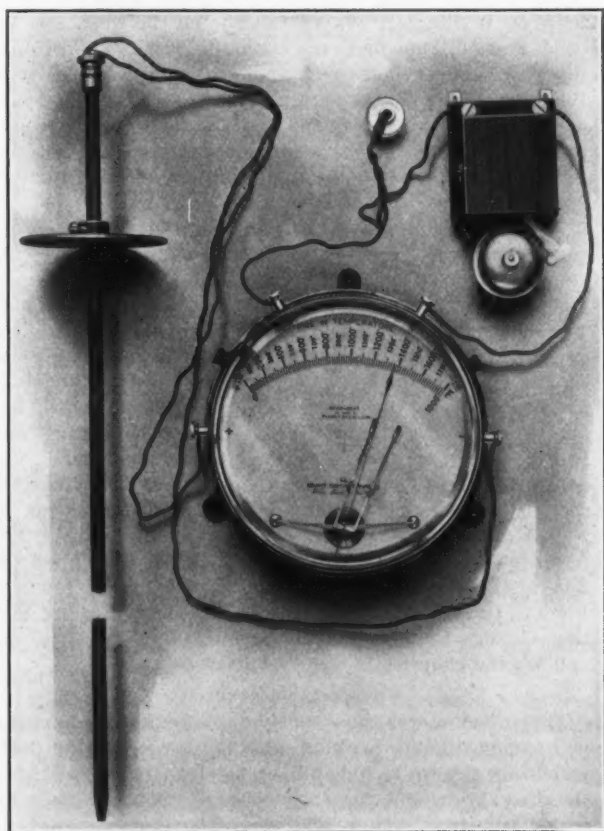
Where the drill is used underground the exhaust is either carried through a steam hose to a waste pipe leading to the mouth of the shaft or tunnel, or is run through a special valve into an inexpensive chemical solution which absorbs it. The constant suction of the intake of the engine draws air to the place where the drill is operating, and is a means of furnishing ventilation.

The advantages claimed over air drills are that the piston does not rotate, which avoids wear and friction on

the piston and rotating device; that it is impossible to knock out a cylinder head, that excessive vibration is eliminated by counterbalancing, and that there is nothing to freeze. This drill also has the advantage of low cost of equipment. It can be made as cheaply as an air drill, and contains in itself the complete power plant to operate it. It is claimed to save from 50 to 80 per cent. in fuel over air drills, besides cutting out the engine, boiler, air compressor, receiver, pipe lines, maintenance and depreciation of plant and salaries of men to operate the power plant.

The Advance Alarm Pyrometer.

An important function has been added to the Advance electric pyrometer—that of warning by an electric bell when the temperature it measures passes prescribed maximum and minimum limits. This instrument, as made by the Wilson-Mauehlen Company, 1 East Forty-second street, New York, is now available in three forms



The Parts of the Advance Electric Pyrometer with Temperature Limit Alarm, Made by the Wilson-Mauehlen Company, New York.

—indicating, recording and alarm, or any combination of these forms, applicable to the measuring of any high temperatures as in furnaces, ovens, lead baths, bustle pipes, flues, &c.

With the alarm type, the alarm may be sounded wherever desired—at the door of the furnace or any distance away. A recording pyrometer shows what the temperature was at any time past or at the moment, if it is looked at, but the alarm pyrometer does not have to be watched. It can be quickly adjusted for whatever points are selected for maximum and minimum limits of temperature, or for either of them, or may be instantly adjusted to act as a simple indicator. A blast furnace attendant frequently has so much to attend to that it cannot but be a help to have his attention forcibly brought to the temperature of his hot blast or top gases when they need his attention at some unusual moment.

As the illustration shows, two currents pass through the indicator. One is that which comes from the thermo-couple in the fire-rod and operates the indicating pointer on the gauge. This thermo-electric current does not travel along the pointer of the instrument, but an auxil-

iary current from a lighting circuit or batteries does go through it when it touches either of the alarm fingers which has been set at some definite temperature point. This contact is a gentle one, but is reliable because the bell operates on 110 volts and the contacts are by an iridium pin on the pointer and carbon tips on the alarm fingers. The two contact fingers are adjustable in their position from the outside of the plate glass front, although they themselves are underneath the glass. They may be instantly changed in position and either one or both may be completely thrown out of the scale limits.

The pyrometer itself was described in *The Iron Age* August 8, 1907, and, in principle, is in no way different from other thermo-electric pyrometers. It should be emphasized that the electric circuit, of which the bell is a part, and the current of which passes through the needle or pointer of the instrument, is wholly secondary, secured from an external source and is in no way a part of nor does it in any way affect the thermo-electric current from the fire-rod which passes through the coil of the instrument set between the poles of the magnet and causes the deflection of the indicating hand. The exterior current is employed merely as a means of obtaining power to ring the bell. The apparatus is constructed for the alarm to work on 110 volts, but by interposing a 110-volt lamp it may be used on a 220-volt circuit, or with additional lamps on 440 volts. It is intended primarily for direct current, but will also work on alternating current, but the bell is not sounded so loud with the alternating current. It is very simple to set up and the illustration shows how the wires are to be run. The two wires disappearing into the white porcelain connector in the center show where the alarm circuit is tapped into the house current, or battery current, if that should be applied.

The complete pyrometer as illustrated includes a fire-rod, with an adjustable circular disk, connecting head, complete indicator and bell. The indicator is 10 in. in diameter and is believed to have the largest and most open scale of any pyrometer on the market, so that it may easily be read from a considerable distance, for it is not intended that the alarm feature shall detract from the usefulness of the instrument as a temperature indicator.

Another new feature brought out by this company that applies both to these alarm indicators and any recording pyrometers, is an automatic clock controlled commutator, with mercury contacts, which changes the connection of the alarm indicator or any recorder from one furnace to another every few minutes.

International Standard Pipe Threads.

Note has already been made in these columns of the exhibit of screw threads as used in the United States, prepared under the auspices of the American Gas Institute for the international conference on the standardization of threads in apparatus for the use of gas, which was held in Paris last summer. It consisted of drawings and blue prints, with sample bolts, nuts, cap screws, set screws, &c.; gauges for United States standard threads; standard machine screws, stove bolts, pipe threads, &c. The American Society of Mechanical Engineers co-operated in the preparation of the exhibits through a special committee consisting of E. M. Herr, George M. Bond, William J. Baldwin and Stanley G. Flagg, Jr. This committee has prepared a report on an international standard for pipe threads and fittings which will be submitted to the American Gas Institute. The latter organization has invited the American Society of Mechanical Engineers to assist in preparing an argument in favor of the Briggs standard, to be presented at the international conference in Paris, January 1, 1909.

Freight Rates to Pacific Coast Advanced.—Effective January 1, 1909, the transcontinental railroads will make a general advance of 5 cents per 100 lb. in their rates to Pacific Coast points on a list of about 80 heavy commodities. The principal heavy lines of iron and steel, including steel rails, will be affected by this advance.

Clinton Iron Ores in New York State.

A Recent Investigation of Their Extent and Character.

A report on "Iron Ores of the Clinton Formation in New York State" has been issued as a bulletin of the Education Department of the State. It was prepared in pursuance of an act passed in 1907 appropriating \$5000 "for determining what deposits of iron ore exist within the State of New York and the extent and availability thereof." The operations which form the basis of the report were carried on and the report was prepared by D. H. Newland, assistant State geologist, and C. A. Hartnagel, assistant in economic geology. In transmitting the report the State geologist, John M. Clarke, says that it "conclusively indicates that in the region of central New York there exists a commercial asset in iron of great magnitude and vast importance to the people of this State, and the conclusions herewith set forth are in essential accord with the prediction made when it was recommended that the work be undertaken." Below are given data condensed from the report, these dealing chiefly with the mining operations thus far carried on in the Clinton formation.

Operations of a Century Ago.

The hematites accompanying the belt of Clinton strata in New York State have been worked commercially with interruptions since the early part of the last century. Regular mining operations were not begun until about 1825. A few years later charcoal forges and blast furnaces had been erected in Wayne, Madison and Oneida counties. The production of Clinton ores has averaged about 75,000 tons a year in the last few years. In 1907 it was 109,025 tons. The report puts the aggregate between 4,000,000 and 5,000,000 tons, "which is approximately the yield obtainable with the average workable seam from a square mile of area." Mining has been restricted entirely to the surface portion of the beds. The Clinton strata, comprising shales, limestones, sandstones and interbedded layers of iron ore, are found in a single bed which extends from the eastern central part of the State to the Niagara River, and thence for some distance into the Province of Ontario. The length of the belt included in New York State is about 225 miles, but it attains its largest extent between Utica on the east and Rochester on the west, a distance of about 135 miles. This portion of the belt passes through the counties of Oneida, Madison, Onondaga, Oswego, Cayuga, Wayne and Monroe. The width of the outcropping strata at the maximum is about 5 miles. It is greatest in the central part in the vicinity of Oneida Lake and immediately westward. It diminishes very gradually away from that section, narrowing more quickly toward the east, mainly because of the increasing inclination of the bed in that direction.

A New Estimate of Clinton Ores.

It was to be expected that the writers of the report would find reason for a better estimate of Clinton ores than has prevailed heretofore, in the increasing demand for iron ores of all qualities and the general appreciation in the value of iron ore in the ground as exemplified in the Great Northern ore deal. This is indicated in the following paragraph which appears early in the report:

The resources of the Clinton formation, known to exist within easy reach of mining operations, are so extensive that they seem to offer a promise of increased commercial importance for the future. The principal handicap to the use of the ores, hitherto, has been their relatively low iron content—from 35 to 45 per cent. But with the rapidly growing demand made upon other Eastern mining fields—which has been reflected by a steady falling off in the quality of the product in most cases—its effect is now much less apparent than formerly and will be subject, doubtless, to further reduction. A factor of considerable importance, also, in this connection is the fluxing nature of the Clinton ores, which counterbalances to an appreciable extent their deficiency of iron when used in the furnace.

Character of the Formation.

The Clinton beds are uniformly inclined toward the south. The lowest dips are in the central portion of the belt in Wayne and Cayuga counties, and the beds are

more highly inclined as they come more and more within the zone of the Appalachian uplift. In the eastern portion of the formation the Clinton outcrop reaches its highest elevation at about 1400 ft. At Clinton, Oneida County, the elevation is about 700 ft. Little effort had been made previous to the work undertaken last year toward the exploration of the Clinton ores outside the limited section in which they are mined. In the stretch from the Oneida, Herkimer County, line to the western border of Wayne County, a distance of 120 miles, measured on the outcrop, only a small portion is revealed sufficiently by exposure or mining excavation to permit of investigation from the surface. The appropriation made last year made it possible to put down a number of test holes along the concealed portion of the outcrop and for the first time to establish the position, extent and character of the ore in a general way over many parts of the area. The original plan, which called for the drilling of holes at intervals of four or five miles east and west, could not be carried out owing to the limited appropriation, so that the conclusions of the report seem to be based largely on the revelations of eight holes put down between Wallington, Wayne County, on the west, and Verona Station, Oneida County, on the east. The average interval between holes was about 10 miles, and most of the sites were selected with a view to striking the ore at a depth of between 100 and 200 ft. The character and thickness of the various strata encountered are detailed for each of the test holes, and analyses are given of the ore encountered in each case.

In general, the Clinton ores are red hematite. In some specimens a little specular hematite is present; siderite or iron carbonate also occurs locally in small amount, distributed in fine particles through the mass. The bulk of the ore, however, is amorphous hematite, red or brownish red in color and streak. The specific gravity ranges from 3.5 to 3.8. Certain structural peculiarities are described by the terms oolitic, lenticular, fossil, &c., applied in different localities. The fossiliferous and oolitic structures are sometimes found together. The oolitic structure characterizes the main bed in the eastern section, particularly around Clinton and the towns of New Hartford and Westmoreland, Oneida County. The fossiliferous ore appears at Clinton, in what is called the flux bed, and forms the single deposit in the town of Verona, Oneida County. The ore mined at Sterling Station, Cayuga County, and in the entire section of Cayuga and Wayne counties is also fossiliferous.

Chemical Character.

The Clinton ores show considerable regularity in chemical composition. Leaving out locally occurring beds which are generally too thin or too lean to be workable, the ores throughout the state average about 40 per cent. in metallic iron. They seldom go above 45 per cent. or below 35 per cent. The higher limit is approached by the oolitic bed in the vicinity of Clinton, where the mines of the Franklin Iron Mfg. Company have returned an average of 44 per cent. through a period of years. The fossil ore in the western part of the State runs from 35 or 36 per cent. to 44 or 45 per cent. The following represents the average of a large number of analyses of Clinton ores from Oneida County:

Fe	44.4
SiO ₂	13.09
Al ₂ O ₃	5.99
MnO	0.19
CaO	5.85
MgO	2.69
S	0.31
P	0.53
CO ₂	6.08
H ₂ O	1.45
O in Fe and P	19.71
Total	100.29

Phosphorus and sulphur are both comparatively high in the Clinton ores. The former is seldom less than 0.25 per cent. and ranges up to more than 1 per cent. Reckoned on the basis of metallic iron, the phosphorus content will average from 1 to 2 per cent. The sulphur is more variable, being found in some ores only in traces and in others running up to 0.5 per cent. It occurs always in the form of pyrite, which seems to be

associated rather with the shale partings than intermixed with the hematite. Between the ore and wall rock there is often a thin seam of pyrite.

Mining Methods.

Attention has naturally been directed to the northern edge or outcrop of the Clinton beds as being the most accessible for development. The conditions are favorable for stripping or trenching throughout much of the stretch from Herkimer to western Wayne County. In places the ore is found directly beneath the soil, or at most a few feet of glacial material, and its flat dip makes it possible to extend operations to considerable distances from the outcrop before the overburden becomes excessive. At Ontario Center, Wayne County, the Furnaceville Iron Company has been engaged in working a strip of land extending for 4 miles in an east and west line. The plan consisted in opening longitudinal trenches, the first along the northern limit of the property near the outcrop, and the following ones in parallel order progressively with the removal of the ore from the preceding trench. At present about 20 ft. of overburden is taken off, while in the first cut the ore lay beneath 6 ft. of soil and rock. The trench has a width of 60 ft., and at first two shovels were used each cutting 30 ft. The shovels loaded into buckets, which were hoisted by revolving derricks and dumped on the spoil bank opposite the long face of the trench and just beyond the edge of the ore that was being uncovered. In the past year the trenching has been done by a single 100-ton shovel, which removes the rock for a width of about 45 ft., dumping directly on the spoil bank. Of the 20 ft. overburden 10 ft. consists of limestone somewhat shaly toward the top, and there is about the same thickness of soil and glacial material. It is loosened for the shovels by drilling and blasting. The 6-in. holes made by churn drills extend into the ore for about 3 in. and are 16 ft. apart. A layer of limestone 15 to 18 in. thick that remains on the ore has to be removed by hand. The ore is then loosened by blasting, after holes 3 ft. apart and extending a few inches into the underlying green argillaceous limestone have been made by steam drills. A small amount of limestone sometimes adheres to the ore, but is readily removed. The ore is broken by sledges into convenient size for handling, after which it is loaded by means of a 40-ton steam shovel into the buckets of a derrick and hoisted into cars for shipment.

The Fair Haven Iron Company has pursued a similar plan in opening the property at Sterling Station. The shale and soil covering is from 10 to 20 ft. thick, and its excavation presents less difficulty than the limestone farther west. The mines at Clinton furnish the only examples of underground exploitation of these ores. The long wall method is employed, the same as used in many coal mines. It permits of complete extraction of the ore in one operation.

It is considered economical to remove the ore by open cutting when the covering does not exceed 20 ft. With a 2-ft. ore seam which yields approximately 8000 gross tons to the acre of surface the cost of stripping and removing ore under ordinary conditions is put at about \$1.50 a ton. It is reported that underground mining has been carried on at Clinton for somewhat less. But there the ore is from 30 to 36 in. thick.

Principal Mining Operations.

The report devotes considerable space to a description of ore localities and mines. Referring first to the western end of the formation, some details are given of the operations first begun about 35 years ago near Sterling Station and revived in 1906 by the Fair Haven Iron Company, representing chiefly Albany capital. The ore as shown in the trench ranges from 30 to 38 in. thick, the average mineable ore being about 30 in. Analysis of the ore shows 34.98 per cent. metallic iron, 0.351 phosphorus and 0.044 sulphur. Shipments in 1907 are reported to have averaged between 36 and 38 per cent. metallic iron.

Some distance west of Sterling Station ore was mined in 1887 and 1888 by the Furnaceville Iron Company, which still owns the property. The thickness of the ore

as mined ranged from 30 to 40 in. At present the Furnaceville Iron Company has under exploitation a strip from Ontario to Ontario Center, Wayne County. A little over 20 ft. of rock and soil are removed from above the ore bed. Ore is shipped to Emporium, Pa. Analyses show 41 to 44 per cent. metallic iron and 0.494 to 0.578 phosphorus.

The section of the Clinton belt extending through New Hartford, Kirkland, Westmoreland and Verona, Oneida County, has afforded most of the ore obtained from the formation in the eastern part of the State. For some years past operations have been restricted to the properties just east of Clinton owned by C. A. Borst and the Franklin Iron Mfg. Company, which obtain the ore entirely by underground mining. The mining of the Clinton ore for paint manufacture has been carried on by C. A. Borst since 1890, from 5000 to 10,000 tons a year being produced for that purpose. At the Franklin and Clinton mines an area of about 200 acres has been worked over by underground mining or by stripping, the latter method having been used at first, and the total ore product is estimated at about 2,000,000 tons. The Franklin and Clinton are a part of the properties of the Franklin Iron Mfg. Company, and have always been operated in connection with the company's furnace at Franklin Springs, two miles south of Clinton. Since the rebuilding of the Franklin Furnace in 1883 the mines have been intermittently active, producing about 60,000 tons a year when operated. They were closed down in November, 1907, after a campaign of two years. The ore as roughly mined will run about 40 per cent. metallic iron. The average return in the last period of operation is said to have been 40.27 per cent. By removing the rock parting the iron content can be raised to 45 per cent.

A 600,000,000 Ton Estimate.

The above résumé indicates generally the scope of the report and the basis of the extravagant statements recently made in the press as to the future of New York as a producer of iron ore. Indeed, the State Commissioner of Education, under the auspices of whose department the report is published, says in a prefatory note that if the State geologist's estimate of 600,000,000 tons of ore in the Clinton formation is warranted, "New York might easily become the leading iron State in the Union." In the first place, the eight holes 10 miles apart put down in a portion of the Clinton formation are a very slender basis for any estimate of tonnage, and the surprise is that the State geologist's office should have ventured on an estimate, which, even as qualified in the report, is bound to excite expectations that will be disappointed. This is the statement:

The volume of ore which is subject to estimate within the areas mentioned is such that it must be considered one of the more important reserves in the present fields of iron mining. A great proportion, of course, will not be subject to profitable extraction for many years to come. But if limitations be put upon the estimate, so as to bring it into relation more or less close with the existing status of the mining industry, the total will still be large. Thus, to provide a reasonable basis of calculation, we may exclude all ore that is below 18 in. thick or more than 500 ft. from the surface, also leaving out of account the beds that are below the average in iron content. Under these restrictions the quantity available in the three principal areas may be placed at approximately 600,000,000 tons.

The thinness of the seams, the relatively high expense of mining, and the low grade of the ore clearly preclude an extensive use of the Clinton hematites under present conditions of the iron trade or conditions likely to exist in this generation or the next. The fact that furnace after furnace located on the Clinton formation passed out of existence in the last century, while centers of iron making activity have been built up elsewhere and have grown steadily greater, tells the story. The Clinton ores may have another day, when the exhaustion of Lake Superior ores, which has been so glibly prophesied, becomes a fact; but that remote contingency does not call for any immediate enthusiasm over these recent disclosures of the New York State Geologist.

The offices of the advertising department of the American Sheet & Tin Plate Company, J. Craig Wilson in charge, have been removed from the Bailey-Farrell Building to 54 Imperial Power Building, Pittsburgh.

THE IRON AGE

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					HARDWARE EDITOR.

The Problem of Operation Without Orders.

It will be agreed that considering its seriousness the industrial depression of the past year has had less advertising in the press than any of its predecessors. Were it not that the exigencies of the Presidential campaign required that an issue be made of the dinner pail, probably even less would have appeared in print concerning the departure of prosperity. The suppression of the calamitous and the emphasizing of all the favorable aspects of the industrial situation have been so marked in the policy of the daily press in the past year as almost to suggest concerted effort. There has been, too, comparatively little discussion of the causes of such recessions or of preventive or curative legislation. The return of several hundred thousand foreigners to Europe since the panic has simplified to that extent the problem of unemployment, and there has been little or no agitation for more stringent immigration laws for the protection of the home labor market. Indeed, so unanimous has been the disposition to consider only the rate at which lost ground was being recovered in all industries and to make the most of all evidences of improvement, that only occasionally and locally has the suggestion come out that public work be undertaken for the purpose of giving idle men employment.

The contrast is sharp with what is going on in Great Britain in this respect. There, for an increasing army of men, the uncertainty of getting employment is coming more and more to mean the certainty of not getting it. And Germany, which seemed at first to be resisting successfully the shock of the American panic, is now greatly concerned over the serious situation of her unemployed. Both countries have pushed out far enough on lines of paternalism to make possible the further steps now called for in providing work or relief for the unemployed, without any violent wrenching of precedents.

In Great Britain the activities of the labor party have been so effective in securing legislation in the interest of employees that the proposals in behalf of the unemployed should not encounter great resistance. Yet, now that winter is at the door, the Government has but the usual makeshifts to offer. Widespread discussion is on, of the permanent aspects of the problem, and the necessity of coping with them in new ways. That important departures are being considered appears from the following, which we find, not in a socialist newspaper, nor in a speech of one of the labor party leaders, but in the editorial columns of the *London Engineer*:

To continue manufacturing when sales cannot be effected means to continue spending money on material and wages when none is coming in. Few works can afford to carry on such a

system for long, and the usual course is to reduce the weekly wage bill by dismissing men. Would it not in such cases be possible for the Government to advance money week by week so that manufacture might be continued? Money would be far better spent in such a way than on relief works, and it would return to the Government ultimately when the product was sold. Big firms are, of course, helped by their banks and by the resources of their own members, and by calling, in some cases, on reserve funds to keep their businesses together in bad seasons, but the practice is far from general.

The suggestion comes out in an article on "Labor Storage," which deals with the need of some means of "storing" labor when there is no demand for it—setting labor at work in dull seasons on the production of commodities that will be used when business revives. In the United States we have had voluminous discussions on ways and means of putting Government funds at the disposal of trade and industry, in times of unusual demand for money; but the banks have always figured as the instruments of such distribution. The suggestion that farmers should be able to get Government funds direct, with their crops as security, has come up, it is true, but never in a way to challenge serious consideration. But the idea of our London contemporary that manufacturers be government aided to keep their plants going in hard times and their workmen on the payroll, has not yet found a place on the Populist programme, possibly because the money would pass through corporate hands before reaching the workman.

There are many steps between offering such a proposal and practically embodying it in a workable scheme. To "take the tops of waves of occupation and throw them into the hollows" would be solving one of the greatest of economic problems—one almost as great as the abolition of poverty. In this country we are having in the present depression more regulation of industrial conditions by specially directed effort than was ever attempted. Railroad wages have been held up by influences proceeding from Washington. In the steel trade wages have been substantially maintained as a result of the co-operative movement to maintain prices of products. But to continue indefinitely the operation of plant when orders are not in hand—that is something for which the new American political economy has laid down no formula. It will not do to say, however, that some good work may not yet be done in reducing the peaks and filling up the troughs now described by the curve of our manufactured product over a period of years.

The railroads have been commonly singled out as having in their hands a partial cure of the iron trade's habit of violent fluctuations in prices and output. But the railroads, in turn, are dominated by the fluctuations in the price of money. They cannot afford to sell securities at low levels and put the money thus dearly bought into track and equipment at high level prices. When some progress has been made in reducing the swing in money rates, a beginning will have been made in flattening the plotted curves of iron and steel values and output.

With so large a percentage of its population engaged in agriculture, the United States will not feel so acutely as Great Britain the problem of unemployed industrial workmen. At the same time the bearing of the question upon international competition makes any effort at its solution abroad of vital interest to manufacturers at home.

Government ownership of railroads in Europe is developing some rather unsatisfactory results. Both Belgium and Switzerland report heavy deficits for the current year. Belgium is considering the necessity of a general increase in passenger and freight rates to relieve the situation. In Switzerland the unfavorable results of

state ownership promise to make this question a leading issue in the approaching elections. The mere matter of government ownership does not insure satisfactory operations of railroads.

Extending the Life of British Patents.

An interesting side of the much discussed British patent law as it now stands, is the provision for extending the life of a patent beyond the 14 years of its original term. Formerly it was necessary to secure the action of the Privy Council in order to procure the privilege, and it has been exceedingly rare that the attempt has been made, or, at any rate, that an extension has been granted. The law now transfers jurisdiction from the Privy Council to the High Court, and rules have recently been laid down by the court which may have an important bearing on the existence of patents as time goes on, though it is not quite clear to what extent inventors will be able to make use of the provision of the law.

Briefly, under the law, the court must determine from the evidence whether the public or the inventor has been the greater gainer by the existence of the patent; whether the disclosure of the invention in the patent has given to the public the better of the bargain, in that it has gained in excess of the benefit enjoyed by the owner of the monopoly. There would, perhaps, be many cases resulting under this section of the law were it not for the ruling of the court that the petitioner for an extension must prove that he has done all that a patentee could do to launch his invention on the British market. No non-used patent would come in this category. Doubtless some inventors will consider that they have not received fair remuneration for the fruits of their brains. As was the case when the United States Patent laws contained a similar provision, instances may arise where the patentee through lack of means or other hindrance is unable to establish a market for his invention during the earlier years of the patent period, but has finally built up a business, the mainstay of which is the monopoly of the patent protection. There are likely to be cases where an extension from the comparatively short period of 14 years might be well justified. Probably, though, there will be other cases where an extension would do harm to no one nor good to the patentee because of lack of merit in the protected idea. The existence of the law may prove important in its indirect influence on certain cases, though it must always go hand in hand with the compulsory working clause of the British law.

Until early in the '70s the United States had a similar provision in its patent law, the patentee having, at the discretion of the Patent Commissioner, the privilege of a seven years' extension. To-day, the only extension is by act of Congress, a very rare proceeding indeed. Under the old law the commissioner determined the case on three factors—novelty of invention, diligence in working it, and the remuneration of the patentee, together with the consideration of the existence of corresponding expiring patents in other countries, where the inability to procure extension would throw the invention open to general use, with probable injury to American industry. Great Britain has continued the policy of extensions, the present change being toward accessibility of the tribunal having jurisdiction.

As the law now exists, the patentee has but 14 years in which to exercise his monopoly, unless there are special reasons why the term should be prolonged. In considering the question of extension, the court "shall have regard to the interest and merit of the invention in re-

lation to the public, to the profits made by the patentee as such, and to all the circumstances of the case." In the case under notice, letters patent were granted James Johnson for an invention of a method of exhausting moisture from air for blast furnaces and converters. An assignee of the patent applied for an extension. In the course of a judgment, as the result of which he refused the application, Justice Parker laid down certain principles considered of great importance. He said that in order to decide whether an extension should be granted the court must consider the nature and importance to the public of the disclosure made in the specification, and for that purpose questions of novelty and subject matter are necessary material; and it is the duty of the petitioner for an extension of term to bring to the notice of the court all that may in any way affect the judgment of the court in these matters. But if, after hearing the evidence of the petitioner's witnesses, there is in the opinion of the court a *prima facie* case for upholding the validity of the patent in respect to novelty and subject matter, the court need not, as a general rule, investigate the matter further, it being always open to the objector to challenge the validity of the patent in proceedings more appropriate for that purpose. For the purpose of considering whether the patentee has been adequately remunerated, profits on his corresponding foreign patents must be taken into account, and some allowance ought also be made for profits which in all probability he received in respect of both before their expiration.

The Factory Fire Pump and Its Care.

Underwriters are giving more careful attention to their rules governing the location and care of fire pumps in factory installations. It is asserted that instances of negligence in this very important department of fire protection are far from rare, especially in permitting pumps or their water connections to freeze. Pump manufacturers state that every spring they have large numbers of pumps to repair that show evidence of having been under severe strains due to ice within their working parts, a condition made possible by the location of the apparatus in rooms where no provision is made for a continuous temperature above the freezing point.

It is almost farcical that a manufacturer will go to the expense of installing fire pumps, not only to secure greater assurance of protection from fire, but also that he may get low insurance rates, or in some cases even decently low rates, and then permit the engineer to place the fire fighting equipment where it cannot be depended upon during very cold weather because it may be frozen and out of commission when the emergency for which it is intended shall arise. The hydrant service, or where the dry system of automatic sprinklers is employed, the sprinkler system then becomes useless. Occasionally a case arises where the plans had safeguarded the installation against the cold, but where neglect has permitted the freezing. The underwriters have been blamed for not enforcing very strict rules governing these conditions, and now, it is understood, the matter is receiving more serious thought, with a view to making the insurance restrictions governing installations and their maintenance as severe as those defining the design and construction of the apparatus itself.

The fire pump has become an important adjunct of the equipment of industrial plants, not only where there is inadequate protection from the community's fire department, but also in the larger centers where, theoretically at least, outside safeguards are wholly satisfac-

tory. It is considered a sound investment in the way of insurance to have on the premises the means of restraining a fire in its inception through the quick action of the shop fire department. Many a fire would have been checked before reaching serious proportions had there been facilities for procuring instantly a powerful stream of water. Many serious losses have been averted by the presence of the fire pump. But to accomplish this the pump must be able to start at a moment's notice, and to run at full speed without delay. Therefore the apparatus must be cared for as diligently as that which enters directly into the production of a plant.

In a great many cases this is easier of accomplishment than formerly, largely because a pump may be installed with electric motor drive and operated independently of the general power equipment. Thus driven, the pump is now frequently used in connection with the automatic sprinkler system, the bursting of a sprinkler head causing the motor and its pump to start immediately, furnishing the sprinklers with ample water supply and pressure. The advantage of the dry system in cold weather is self evident. But if the pump is to be permitted to freeze, the purpose is frustrated.

A fire pump operates at infrequent intervals; it is usually idle, excepting during test or fire drill. It is, therefore, easy of neglect. It remains an unessential part of the equipment of a plant until it is needed in the emergency of fire, and then it is all important. A busy manager may easily forget the nonproducing elements of his works; he must place these responsibilities upon subordinates who sometimes shirk their trust. Possible negligence constitutes a factor that must be taken into account by the engineers who plan the installation. It must be where neither fire nor frost can reach it. If the main power plant is in a building separate from the works, the pump may be placed there. With many city factories, yard room is small and power plants are embodied in the main building, and in such a case it is wise to fireproof the pump room so that should the building catch fire the flames could not reach the pump, a practice wholly feasible in connection with an electric motor, the current for which could enter from outside through a conduit. A recent suggestion is that the pump room be accessible from the exterior of the building through an underground passage from some other structure, permitting the entrance or egress of a man during a fire. A favorite and logical installation for a fire pump is in a small building away from the plant and heated during cold weather. In water power installations, where the pump is driven direct from the wheel, the tendency has been to locate the pump in the basement region of the main building, which is a wholly undesirable arrangement.

Fire underwriters have accomplished much in the development of the fire pump itself. They have greatly raised the standard of construction and efficiency. Special attention has been given to deterioration and the likelihood of a pump being put out of commission through the careless act of some person ignorant of its construction. The latest types of pump are highly satisfactory. Especial improvement has been achieved recently in the rotary type, which for close to a century has been doing service in fire protection. While general principles of design have not changed very much, the type has been refined in many ways until it is far more reliable and economical. The underwriters' rules have held the pump builders to sharply defined standards in design and details of construction. A great deal of good work has been done in this direction, but the claim is that a

considerable percentage of the labor has been wasted in actual practice because of insufficient restrictions as to the place and manner of installation and as to maintenance.

CORRESPONDENCE.

Tool Steel Making in Europe and America.

To the Editor: It is unfortunate that an article interesting and reasonably correct from a historical standpoint should be perverted by the author in an effort to advertise his own wares. This refers to your article on "Tool Steel Making in Styria," published in the issue of November 5. When an American steel maker is asked to address a scientific society, according to American ethics, he refrains from taking advantage of the situation to advertise the goods he has for sale. Possibly there may be a different code of ethics in Europe, and from their point of view it may be justifiable to seize upon an opportunity like this to drum up trade.

To any one who has come in touch with the stolid European workmen, the talk of handing down the traditions of the trade from generation to generation is absurd nonsense. One has only to compare the European workmen with the much more intelligent class of men to be found in American steel works. There is more of the disposition in Europe to guard jealously the little secrets of the trade, some of which are at best of questionable value, and the result of this effort is to keep new knowledge out of their works instead of keeping the old knowledge in. There is a law in England imposing a penalty of two years' imprisonment with or without hard labor or a fine or both fine and imprisonment upon any person who improperly discloses trade secrets. In other words, their policy is to fine and imprison any one who tries to meet with other people in the same occupation and effect an interchange of ideas for the general advancement of the trade. This is characteristic of England, and applies equally well to Austria. This one thing probably has done more than anything else to keep European manufacturers at the tail end of the procession.

EUROPEAN AND AMERICAN CRUCIBLE PRACTICE.

Referring to the article in question, the American tool steel makers will not agree with many of the statements, particularly in regard to the methods of using crucibles, wherein they state a crucible is only used once, and endeavor to furnish a plausible reason. The true reason without doubt is that the crucibles are of such poor quality that they will only stand one heat, whereas in America an average of six or seven heats is expected. You may be very sure that the European steel maker would get six or seven heats out of his crucible also if he knew how to do it. A new crucible will "throw" more graphite and other elements into the steel than one which has been used several times. The practice of American steel makers is to melt only the lowest grades in the first heat and make their very fine product on the third or fourth heat, in which the character of the steel will not be so much contaminated from the walls of the crucible.

The description of the crucible melting furnace sounds very primitive, particularly the preheating chambers. It is surprising that a concern claiming to be progressive will still stick to what is known as "ladle heats"—that is, the entire content of the furnace is dumped into a ladle in which it does not have time to become thoroughly mixed, and the chances are that each ingot contains as many varieties of steel as there were crucibles used.

Careful research shows that it is impossible to make a large ingot which will show exactly the same analysis at the top, bottom and center. Why exaggerate this by copying the open hearth method of teeming, when the peculiar value of crucible steel is in the fact that it is manufactured in small units?

The practice of the American steel manufacturers is to put the product of each crucible into a single ingot, generally 4 in. square, the cooling taking place so quickly

that segregation is not possible, and uniformity of material results. Each ingot is cropped and carefully graded according to the carbon percentage, the quality of the steel having previously been determined by the quality of raw material used.

CUSTOMERS' REQUIREMENTS STUDIED HERE.

The American steel maker greatly excels his European competitor in one particular point, and that is he is not only a steel maker, but he is an engineer of wide and varied experience. He makes it his business not only to understand his own methods of manufacture, but he acquires every detail concerning the requirements of his customer. The result is that he brings to bear upon the tool steel business a rare faculty of judgment in selecting the kind of steel best adapted to each requirement. A tool steel may be of wonderfully good quality, yet if the carbon percentage be too high or too low for the particular kind of tool required, the result will always be disappointing.

The American tool steel manufacturer is close to his customers and studies their requirements and their practices much more closely than is generally understood. The European manufacturer is so far away from the consumer that it becomes a hit or miss proposition. He cannot study the individual requirements.

There is no doubt that some exceedingly good tool steel is manufactured in Europe. This we do not deny, but we have never yet analyzed a piece of European tool steel which could not be duplicated or excelled in this country by any one of half a dozen leading tool steel makers, and with much more uniformity, in addition to being sold at a lower price.

There is a certain class of people who are always looking for the mysterious. If they could get tool steel made in the moon they would swear by it, even though the quality might be so poor that they really should swear at it.

There is more tool steel made in the United States in one day than all of Europe produces in a week. Our European competitors must remember that William Kelley really was the inventor of the Bessemer process. They must remember also that although tungsten was first experimented with in England, it remained for America to develop the modern high speed steel with chromium and tungsten combinations, and every one of the European manufacturers has had to take his cue from the Americans. Even recently, still further advances have been made in the American manufacture of high speed steel, of which, as far as we know, the Europeans have not yet learned and therefore not yet copied.

The American steel maker is the greatest student along metallurgical lines in the world. His product is shipped to every corner of the globe, and America may be safely said to take the lead in tool steel manufacture, as well as in modern production of open hearth and Bessemer product.

E. T. CLARAGE,

President Columbia Tool Steel Company.

CHICAGO, November 7, 1908.

The Portland School of Trades.

To the Editor: In a recent issue of *The Iron Age* I noticed an account of the Milwaukee School of Trades in which it was stated that it occupied a unique position in that it was the only trades school in the country under the direction of the public school system. I wish to correct that statement. We have a school of trades here under the direction of the Board of Education. The school is an integral part of the public school system. We have 120 students in the day courses. We have a very well equipped drafting room, and machine, pattern, plumbing, molding and carpenter shops.

GEO. W. HAMILTON, Principal.

PORTLAND, ORE., October 31, 1908.

The Government's final estimate on the corn crop, 2,642,687,000 bushels, makes the crop the third largest in the country's history. These figures show a gain on the October estimate, due to the favorable autumn weather for maturing the corn planted late in the spring.

The Queensboro Bridge Investigation.

Bridge Commissioner Stevenson of the city of New York has made public the report of Prof. William H. Burr and Boller & Hodge, the special commission of expert engineers, appointed to examine the Queensboro or Blackwell's Island Bridge, spanning the East River between New York and Long Island City. Complaints regarding the stability of the new bridge were first heard after the collapse of the Quebec Bridge, both being of the cantilever type. It was then asserted in one of the New York dailies, on information obtained it is understood from a former bridge commissioner, that the lower chord compression members of the new bridge were seriously unsatisfactory, as was the case with the Quebec Bridge. This criticism has been found by the commission of engineering experts to be without foundation.

As originally designed, the bridge was to be built with two elevated railroad tracks on the upper deck, but, without changing the design, it was afterward decided to increase the carrying capacity by putting on two more elevated railroad tracks. The experts now recommend that the original plan should be adhered to; that the stringers of the two inside elevated tracks should be removed to lessen the dead load, and that if elevated trains are run across the other two tracks—which will not be done at present—other reductions of the dead load should first be made. The report says:

It has been shown by actual computations that the bridge has a safe and satisfactory capacity for carrying a volume of traffic under the conditions of control found advisable by experience on the Brooklyn and Williamsburgh bridges, sufficient for a considerable future period and perhaps for a long future period. No elevated traffic can pass the structure for some time to come, as there are no connections for such traffic at the Queens Borough end of the bridge. Whenever such traffic may be required, the two elevated tracks on the upper deck will serve that purpose.

The question of further accommodation for lines of traffic on the upper deck may judiciously be left for later consideration when demanded by future requirements, and when the character of traffic to be accommodated at that time shall become known. It is only necessary so to adjust the accommodations for such future developments as will keep the unit stress in the main truss members within the limits prescribed in the specifications for regular live and dead loads or for those loads combined with the wind loading.

Professor Burr's conclusions are as follows:

The specifications for the chemical and physical requirements of both the nickel and carbon steels employed in the structure are satisfactory and in accord with the best practice of the present time.

Both the shop and mill inspection were efficiently performed, resulting in securing excellent quality of material and the fabrication of truss members of good quality and accurate dimensions.

The various members of the structure possess the full sections required by the unit stresses and the working plans, and the shipping weights correspond correctly to those sections as well as to the computed weights.

The erection was successfully and satisfactorily performed, leaving the trusses in correct alignment and elevation.

Computations in accordance with the specifications for the maximum floor loads show that the capacities of the floors for both the upper and lower decks are satisfactory.

The stresses disclosed by the stress sheet submitted with this report show that a controlled traffic on the four trolley lines of the lower deck and on two elevated railroads of the upper deck, carrying the heaviest cars of their classes now in use in the city of New York, together with a vehicular traffic on the roadway and two loaded sidewalks, may be permitted without exceeding the specified unit stresses for the regular live load and dead load.

The report makes the following final recommendations with regard to the lessening of the dead load and the use of the bridge:

1. That the stringers of the two inside tracks on the upper decks or other equivalent dead load be removed to lighten the dead load.

2. That the trolley traffic be so regulated that if four tracks are in use the cars shall not run with clear intervals between them of less than their own length.

3. That the bridge be opened for the traffic of the sidewalks, highway and four lines of trolley tracks as at present constructed, subject to the above recommendations.

4. That if any other moving loads be added to the structure such further modifications of the dead load shall first be made as will keep the total direct stresses caused by the live and dead loads within the safe limits herein set.

Under these recommendations we are confident the structure is perfectly safe.

A Canadian Furnace and Foundry Merger.

The Canadian Iron Corporation, Ltd., \$1,720,000 of whose 6 per cent. mortgage bonds, were offered on the London market on October 26, is a consolidation of existing companies owning blast furnaces at Londonderry, Nova Scotia; Midland, Ont.; Drummondville and Radnor, Quebec, and cast iron pipe and car wheel foundries at Londonderry, Nova Scotia; Three Rivers and Montreal, Quebec, and St. Thomas, Hamilton, Midland and Fort William, Ont. The capitalization of the new concern is: Preference shares, \$3,000,000; common stock, \$5,000,000, and mortgage bonds, \$2,500,000.

This is the first merger of a comprehensive character that has taken place in the iron and steel industry of Canada. It is true that the Hamilton Blast Furnace Company and the Ontario Rolling Mills Company in 1900 merged their interests in what is now the Hamilton Steel & Iron Company. This, however, was only the merging of industries carried on in the same center of the trade. In the new merger secondary industries—car wheel and cast iron pipe making—are consolidated with a primary industry, the manufacture of pig iron. Four iron making plants located in three provinces, and as widely apart as Midland, on Georgian Bay, and Londonderry, on the Atlantic Coast, are of the consolidation, and this is the first time that any such consolidation of companies at the primary stages of the industry has been brought about.

It is a most interesting consolidation from a fiscal, an economic, a historical and also an imperial point of view; for, with English capital invested in the bonds of the new company, English capital is again employed in iron making at Londonderry, where the industry was first begun a little more than half a century ago, and where, for those times, quite a large amount of English money was lost during the years from 1855 to 1883. No fewer than 13 companies have now operated at Londonderry since 1847, and until the eleventh of these companies was chartered by the Nova Scotia Legislature in 1885, and Canadian interests came more fully into the undertaking, most of the capital came from England, and the furnace puddling plant and other equipment was under the superintendence of English iron and steel men.

The Furnace Interests in the Merger.

The blast furnaces of the newly organized undertaking are five in number: Londonderry, 1; Drummondville, 2; Radnor, 1, and Midland, 1. The Londonderry Furnace is of 100 tons capacity. It is of the old type, and was built in 1880 by the late David Adamson of Manchester for the Steel Company of Canada, the English Company which owned the plant until 1885, when it was succeeded by the Londonderry Iron & Steel Company, which in turn was succeeded in 1903 by the Londonderry Iron & Mining Company, now merged in the new Canada Iron Corporation.

From several aspects the Londonderry Furnace is the most interesting furnace now making iron in Canada. It is the largest furnace at which Canadian ore is used, and consequently it earns bounties under the law of 1906 at double the rate paid in respect of pig iron made at such furnaces as those at Sydney and North Sydney, Nova Scotia, and those at Hamilton and Midland, Ont., at which ores imported either from Newfoundland or the United States are used. On pig iron from Canadian ore, such as has for more than half a century been used at Londonderry, the bounty is now \$2.10 a ton. The Londonderry Furnace is also the only coke furnace at work in Canada to-day, the equipment for which was brought from England. The equipment for all the other large furnaces in the Dominion was imported from the United States.

Still another interest attaches to the furnace at Londonderry. The company which owned it in 1883 was bankrupt, and it was to help it out of the receiver's hands that in 1883 the Dominion Government established bounties for the iron and steel industry—began a system which up to the end of the financial year 1907-1908 had

cost the Dominion about \$11,000,000, and committed it to payments which will aggregate another \$10,000,000 or \$11,000,000 before the existing bounty laws expire in 1912.

The two charcoal furnaces at Drummondville, long operated by the McDougall Company, are the smallest furnaces in the Dominion. Their combined output of iron from bog ore does not exceed 12 or 14 tons a day. Like the Drummondville furnaces, the Radnor Furnace makes charcoal iron, and its output is from 25 to 30 tons a day. The fifth furnace that has gone into the merger is at Midland, Ont. It is on the lake front there, of 125 tons capacity, and is in every respect a furnace of the modern type. It draws both its ore and its coke from the United States, and since steel rails began to be made at Sault Ste. Marie, Ont., in 1905, part of the product of the Midland Furnace has gone to the Bessemer and open hearth plant at Sault Ste. Marie.

The Midland Furnace went on the bounty list in 1898. All the other furnaces which are now of the Canada Iron Corporation undertaking had been on the bounty list long before that time. The furnace at Londonderry went on in 1883. The two small furnaces at Drummondville and the charcoal furnace at Radnor went on at about the same time, and, according to a return presented to the House of Commons at Ottawa, on February 14, 1907, the bounty payments to the five furnaces henceforth under the control of the Canada Iron Corporation, between 1883 and June 30, 1906, aggregated \$1,250,640. To the Londonderry Company the total payments during these years were \$571,802; to the Canada Iron Company, in respect of the Radnor and Midland furnaces, the amount was \$588,095, and to the company owning the Drummondville furnaces the Government paid in bounties \$90,743. Since June 30, 1906, the date to which the figures were carried in the Parliamentary return of February, 1907, the payments to the five furnaces have aggregated in round figures \$250,000, so that up to the time of the merger, which was announced in London on October 24, the companies owning the furnaces embraced in it had received not less than \$1,500,640 in bounties from the Dominion Treasury.

The Foundry and Iron Ore Interests.

The Drummonds of Montreal, it has long been understood, practically controlled the Canada Iron Company and also the Canada Iron & Foundry Company, which before the merger operated the car wheel and pipe foundries at Hamilton, St. Thomas, Fort William, Montreal, Three Rivers and Londonderry. The Drummonds were also an important factor in the Londonderry Iron & Mining Company, while the small furnaces at Drummondville and a foundry in Montreal were owned and operated by the McDougall Company. For nearly a quarter of a century the Drummonds have been identified with the political aspects of the iron industry in Canada. They have been prominent in all the movements since 1883 for protective duties and bounties for the industry, and from the first they have boldly taken the stand that the industry must have tariff protection against British furnaces as against furnaces in the United States. Both Conservative and Liberal governments at Ottawa have long regarded them as high authorities on the industry, and at the last revision of the tariff in 1906, when representatives of the Canada Iron & Foundry Company at Three Rivers and at Londonderry urged a reduction of the British preference to safeguard Canadian foundries from competition from Scotland, the duty on cast iron pipe in the preferential tariff was increased from \$5.33 a ton to \$6. Except for the competition from Glasgow, the only competition that the pipe foundries in Canada—now all controlled by the new corporation—have to meet is from American foundries, and against this competition since 1897 the Canadian foundries have had a protection of \$8 a ton.

The ore deposits controlled by the new corporation are in Hastings and Renfrew counties, Ontario; bog ores in the neighborhood of Drummondville and Radnor, Quebec; at Bathurst, N. B., and at Annapolis and Londonderry, Nova Scotia. The largest deposits are those of hematite and magnetic ores in the neighborhood of

Bathurst. These deposits lie about 24 miles to the south of the water at that port, and about 9 miles from Red Pine, a station on the Intercolonial Railway. No large quantities of ore have yet been shipped from Bathurst, but it is claimed that 20,000,000 tons of hematite ore are in sight there; that the ore carries 52 to 55 per cent. of metal, and in the prospectus issued in London it was claimed that the value of the Bathurst property alone is \$10,000,000, and that large profits will be realized from the sale of ore. Before the Drummond Mining Company merged its Bathurst interests in the Canada Corporation, an agreement was made with the municipality that the company's railroad, shipping piers and furnaces, when they are built, should be exempt from taxation for 20 years, and locally there is an expectation that Bathurst will become a second Sydney. E. P.

The Allis-Chalmers Company's Large Orders.

As continued evidence of awakening industrial activity in various parts of the country, mention of some of the orders taken by the Allis-Chalmers Company, Milwaukee, Wis., since the long list recently reported, is of exceptional interest at this time.

In the State of Wisconsin, where authorities estimate there is at least 2,000,000 hp. in unused water powers, large developments have recently been undertaken, and among the important hydraulic turbine plants of this section contracted for with the Allis-Chalmers Company is that of the Northern Hydro-Electric Company on the Peshtigo River. The initial installation will consist of five horizontal twin turbines, having each a capacity of 1500 hp., or an aggregate of 7500 hp., each direct connected to a 1000-kw. alternating current generator, with exciter units of 400 kw. combined capacity, all the machinery being of the Allis-Chalmers Company's build. This plant, which is near that of the Wausau Street Railway Company, now being equipped with hydro-electric units by the Allis-Chalmers Company, will be second in industrial importance for the Head-of-the-Lake country only to the Great Northern Power Company's immense development, where 40,000 hp. in Allis-Chalmers turbines—the largest single Francis wheels in the world—is in operation. The current generated on the Peshtigo River will be transmitted to Green Bay and neighboring towns, to be used for the operation of the street railroad system, commercial lighting and manufacturing purposes.

Other large orders placed with the Allis-Chalmers Company for hydro-electric plants include irrigation projects and central stations for power distribution in the Middle West, the plans of which have not yet been made public. Four noteworthy machines now being shipped from the Allis-Chalmers Company's works at West Allis, Wis., are two 6500 kw. generators of the water wheel type for the Niagara Falls Hydraulic Power & Mfg. Company, Niagara Falls, N. Y., and two 2500 kw. for the Cazadero station of the Portland, Ore., Railway, Light & Power Company. These machines, which are designed for 25 and 33 cycles and speeds of 300 and 333 rev. per min., respectively, have shown some notable results on shop tests, the figure of which will be published shortly.

Among purchases of the steam turbines built by the Allis-Chalmers Company are a 3250-kw. machine, for the Pacific Mills, Lawrence, Mass., which already has three of these turbines and generators in service; units of 1000 kw. capacity for the Cleveland, Southwestern & Columbus Railway and the city of Nashville, Tenn., and 500-kw. machines for the Webster & Southbridge Gas & Electric Company, city of Danville, Va.; Pennsylvania Power Company, city of Dunkirk, N. Y.; Willamette Valley Company, city of Frankfort, Ind. In addition to the main units these orders include exciters, power transformers, lighting transformers, condensers, circulating pumps, switchboards, &c., making complete power plant equipments for the generation and distribution of alternating current.

The Industrial Lumber Company, Baumont, Texas, is preparing to install two engine type generators of 450-kw. capacity, with 17 induction motors; the Johnson Chair

Company, Chicago, has bought a 500-kw. generator driven by a cross compound engine; the city of Waverly, Iowa, recently ordered a belted unit of 225 kw., and the Columbia Shade Cloth Company, New York, one of 300 kw., with a line of 26 direct current motors; the city of Blue Ridge, Ga., has contracted for a 150-kw. alternator, with transformers, switchboard and motors; the Yampa Smelting Company for a 200-kw. induction motor generator set and three 100-kw. transformers; the American Sugar Refining Company for a 500-kw. generator driven by a heavy duty engine; the American Oak Leather Company, Cincinnati, for a 250-kw. belted unit, and the Heekin Can Company of the same place for additional equipment, including 21 motors. All of the machinery ordered is to be built in the shops of the Allis-Chalmers Company and comprises auxiliary apparatus similar to that above mentioned.

The Oliver Iron Mining Company, which has over a score of Allis-Chalmers hoisting engines installed in its mines at the head of Lake Superior, is having three additional units, 28 x 60 in., built in the West Allis shops at the present time; the Alaska-Treadwell Mining Company has ordered a sixth engine of the Allis-Chalmers Company's design, and the Right of Way (Can.) Mining Company, Octave Mining Company and Goldfield Consolidated Mining Company are preparing to install similar units, except that the two hoists purchased by the first named company will be driven by Allis-Chalmers motors instead of engines.

In the pumping engine field a large number of negotiations are being brought to definite conclusion—in some cases after months of delay. Among orders recently placed with the Allis-Chalmers Company is the contract for a vertical, triple expansion, self contained pumping engine, of 12,000,000 gal. daily capacity, to be installed by the city of Milwaukee in its North Point Station, not far from where the first machine of this type ever built has been in continuous service for more than 20 years. In industrial plants, the most noteworthy addition to present equipment is that of the Pittsburgh Steel Company, which has ordered from the Allis-Chalmers Company a double acting vertical compound pumping engine for the delivery of 15,000,000 gal. daily. The Hackensack Water Company, New Milford, N. J., has contracted for a vertical triple expansion pumping engine of 14,000,000 gal. daily capacity; the city of Rock Island, Ill., will install a centrifugal fire service pump with capacity equal to a daily delivery of 2,000,000 gal.; the city of Coquet, Minn., a five stage unit of 1,000,000 gal. daily; the Delaware, Lackawanna & Western Railroad purchased a six stage centrifugal pump for lifting 7,500,000 gal. daily, and the Metropolitan Water & Sewerage Board of Boston, Mass., has ordered a centrifugal pumping engine, with complete appurtenances, for a station of 100,000,000 gal. delivery daily.

Large Pig Iron Mixers.—In commenting on the paper by Arthur E. Pratt on the "Future Development of the Metal Mixer," read before the recent meeting of the Iron and Steel Institute, *Stahl und Eisen* takes issue with the statement that the 750-ton mixer at Ebbw Vale is probably the largest in the world. Our German contemporary claims that while the Ebbw Vale mixer is rated at 750 tons capacity, its charge, up to this year, did not exceed 500 tons. The Rheinische Stahlwerke operates a 750 ton mixer, which it is true is not heated, but it is actually filled every Sunday, and the highest charge was 790 tons. At the Gutehoffnungs Huette a mixer is under construction, which is to have a capacity of about 900 tons.

The A. Garrison Foundry Company, Pittsburgh, is building for C. G. Hussey & Co., also of Pittsburgh, a 24 x 72 in. universal mill for rolling copper, with removable vertical rolls, so that the machine can also be used as a plate mill, being of the same style as one lately built for the Michigan Copper & Brass Company, Detroit, Mich. The firm is also building a five-stand 16-in. hot mill and a 10-in. edging mill, to work in connection with the former, for the Superior Steel Company, Carnegie, Pa.

September Iron and Steel Exports and Imports.

The monthly report of the Bureau of Statistics of the Department of Commerce and Labor shows that the September exports of iron and steel fell somewhat under those of August. The total value of the September exports, not including ore, was \$11,074,653, against \$12,058,561 in August. The figures for commodities for which quantities are given show a rather striking diminution, being only 76,727 gross tons, against 87,198 tons in August. The following table gives these exports for each month of the current year:

Month.	Gross tons.	Month.	Gross tons.
January	74,352	June	69,778
February	81,755	July	86,803
March	96,437	August	87,198
April	93,522	September	76,727
May	64,020		

The details of the exports of the same commodities for September and for the nine months ending with September, as compared with the corresponding periods of 1907, are as follows:

Exports of Iron and Steel.			
September.		Nine months.	
1908.	1907.	1908.	1907.
Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	4,116	6,078	30,568
Scrap	2,654	765	17,091
Bar iron.....	890	1,567	5,691
Wire rods.....	559	946	4,463
Steel bars.....	3,922	8,114	32,561
Billets, blooms, &c....	7,300	1,240	86,315
Hoop, band, &c....	300	825	3,449
Steel rails.....	17,311	34,679	156,098
Iron sheets and plates.	2,952	3,107	32,128
Steel sheets and plates.	5,617	4,170	43,603
Tin and terne plates..	70	751	11,401
Structural iron and steel	9,538	12,148	91,448
Barb wire*.....	4,902	13,222
Wire	4,563	12,475	86,324
Cut nails.....	236	294	5,529
Wire nails.....	1,862	4,071	20,292
All other nails, including tacks.....	527	582	3,536
Pipes and fittings....	9,408	22,957	85,971
Totals.....	76,727	114,778	729,690

* Not separately stated prior to July 1, 1908.

Turning to the imports, the total value, not including ore, for September was \$1,515,584, against \$1,414,416 in August. The imports of commodities for which quantities are given varied but slightly from those of the previous month, being 13,122 gross tons, against 13,186 tons in August. The imports of this character for each month of the current year are shown in the following table:

Month.	Gross tons.	Month.	Gross tons.
January	28,008	June	21,109
February	19,054	July	18,320
March	15,885	August	13,186
April	12,342	September	13,122
May	13,584		

The details of the imports of the same commodities for September and for the nine months ending with September, as compared with the corresponding periods of 1907, are as follows:

Imports of Iron and Steel.			
September.		Nine months.	
1908.	1907.	1908.	1907.
Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	8,339	29,030	65,280
Scrap	404	2,416	3,666
Bar iron.....	718	3,302	15,035
Rails	32	463	1,083
Hoop, band, &c....	170	29	494
Billets, bars and steel in forms n.e.s....	584	1,091	7,234
Sheets and plates....	261	196	1,785
Tin and terne plates.	1,527	3,462	49,712
Wire rods.....	774	625	8,570
Structural iron and steel	313	68	1,785
Totals.....	13,122	40,682	154,644

The imports of iron ore in September were 57,945 gross tons, against 47,130 tons in August. The total iron ore imports for the nine months ending with September were 482,908 gross tons, against 972,340 tons in the corresponding period of 1907.

The total value of all kinds of exports of iron and

steel, not including ore, shows a heavy falling off in the nine months ending with the month of September as compared with the corresponding period of the previous year, the figures being, respectively, \$115,439,368 and \$146,230,407. The imports show a much heavier proportionate decrease, the figures for the same periods being, respectively, \$14,923,195 and \$31,697,879.

PERSONAL.

Hugo Sack, of Rath-Duesseldorf, the inventor of the universal beam mill now in operation at the Rombach Works, is at present in this country.

R. H. Wolff, of New York, the representative in this country of the Heroult electric process, has returned from Europe.

Col. Herbert Hughes of Wm. Jessop & Sons, Ltd., Sheffield, England, is now in this country.

Lloyd E. Shirley has severed his connection with the American Seeding Machine Company as superintendent of its Hoosier Drill Company Division at Richmond, Ind., and has accepted the position of superintendent of the works of the C. S. Bell Company, Hillsboro, Ohio.

E. A. Ennis and E. J. Nelson, formerly with the Mergenthaler Linotype Company as chief clerk and assistant chief clerk, respectively, have opened an office at 173 York street, Jersey City, N. J., as factory systematizers and cost men, under the firm name of Ennis & Nelson.

John R. Morgan, formerly with the Morgan Engineering Company, Alliance, Ohio, as mechanical engineer, has become general manager of the Calumet Engineering Works, Harvey, Ill.

Frank G. Bolles, for several years connected with the International Specialties Company, New York, is now with the Tungstoller Company, New York.

N. O. Fleming, purchasing agent of the Rust Boiler Company, Pittsburgh, will sever his connection with that company November 15 to accept the position of general manager of the Union Foundry & Machine Company, Mansfield, Ohio, which was recently reorganized and incorporated.

Harvey R. Hunter, North Braddock, Pa., has been appointed assistant superintendent of the Edgar Thomson Steel Works of the Carnegie Steel Company, succeeding James M. Rinard.

K. K. Knapp has been elected a director of the Allis-Chalmers Company, succeeding J. F. Neave. Other directors were re-elected.

At a meeting of the American Universal Mill Company, November 6, Charles M. Schwab was elected a director. The company owns the patents of Henry Grey, under which the Bethlehem Steel Company is manufacturing broad flanged light sections of structural steel. The Grey mill department at South Bethlehem, Pa., has been working full ever since it was put on double time last May.

President James A. Farrell, of the United States Steel Products Export Company, sailed for Europe on Tuesday.

Prof. Bradley Stoughton, of the Department of Metallurgy, Columbia University, New York, will deliver an illustrated address on "Iron and Steel," at the Section Meeting of the Franklin Institute, Philadelphia, on the evening of November 12.

Peter Donelson, of James Watson & Co., iron merchants, Glasgow, is now in this country.

The British cruiser-battleship Invincible, at its full power trial November 9, steamed 28 knots an hour for 8 hr. At a recent trial, under seven-tenths of its power, the Invincible attained a speed of 25 knots, and it was expected that at its full power it would reach 30 knots.

The Pittsburgh & Lake Erie Railroad will issue \$5,000,000 in bonds at once, the proceeds to be used for the purchase of new equipment. The road has already ordered 1000 steel cars of the American Car & Foundry Company.

NEWS OF THE WORKS.

Iron and Steel.

The Richmond Iron Works, Richmond Furnace, Berkshire County, Mass., has acquired from Samuel G. Colt the iron furnace property in Cheshire known as the Berkshire Iron Works. In return for this property Mr. Colt has secured a substantial interest in the Richmond Iron Works. The Richmond Iron Works has been in operation since 1829, and the furnace at Cheshire was started in 1872 and has been operated by Mr. Colt for the past few years. Both of these furnaces produce a superior quality of charcoal iron and will be operated by the Richmond Iron Works.

General Machinery.

The Carolus Mfg. Company, Sterling, Ill., has secured and is now occupying the old plant of the Sterling Mfg. Company. Need for more room to secure better facilities for handling its growing business was the object of this move. The new quarters afford increased space, and the capacity of the works has been enlarged by the installation of a number of machine tools, including lathes, drill presses, &c.

Work has been begun on the construction of terminal tracks, roundhouse and shops of the Rock Island Railroad at Hulbert, Ark., under a contract awarded to the Dalhoff Construction Company, Little Rock.

The Crocker-Wheeler Company, Ampere, N. J., has received an order for about 2500 hp. of induction motors from the Clark Thread Company, Newark, N. J. In addition to the size, this order is of considerable importance in that it marks the beginning of the electrification of the Clark mills, which have heretofore been driven by several steam engines. The motors are 5500-volt 16-cycle three-phase machines and range from 25 to 150 hp. each. The excellent showing made by the Crocker-Wheeler engineers in the equipment of a number of large cotton mills in the United States and Canada was a strong factor in the decision of the Clark Thread Company to give the order to the Crocker-Wheeler Company. The company has received an order from the Estey Organ Company, Brattleboro, Vt., for 57 induction motors, ranging from 1/2 to 75 hp., seven transformers and a switchboard. The plant is to be electrically driven throughout, the current to be purchased from the Connecticut River Power Company. Some of the motors will be used for driving individual machines and others for driving line shafting.

The International Harvester Company is preparing plans for converting plant No. 1, located at Genesee and Mechanic streets, Auburn, N. Y., over to electric drive. The present boiler and engine plant will be removed and electric motors, with a total of about 850 hp., will be distributed at various parts of the factory.

The Brooks Tire Machine Company of Wichita, Kan., has established a branch in Buffalo, N. Y., with offices at 391-393 Ellicott square. The company manufactures the Brooks cold tire setter, a hand power machine for upsetting tires cold while on the wheels. J. H. Baldauf of Wichita and Eugene G. Zacher, formerly advertising manager of the Buffalo Forge Company, will have charge of the Buffalo branch.

The C. C. Knight Company, Philadelphia, Pa., is to erect a six-story building, 100 x 180 ft., to cost about \$150,000.

Bridges and Buildings.

The Bollinger-Andrews Company, Pittsburgh, works at Verona, Pa., has received a contract for 500 tons of structural steel for a manufacturing plant in the Pittsburgh District, and other smaller orders which will amount to about the same tonnage.

The County Controller of Allegheny County and the County Commissioners of Washington County, Pa., will receive bids until November 25 for the erecting of a joint county bridge over the Monongahela River at Monongahela, Pa. The structure will consist of two river piers of stone on pile and concrete foundations and two concrete abutments with wings and reinforced with steel. Approaches are to be filled and paved. The superstructure is to comprise three trusses, each 455 ft. long, with a 24-ft. roadway on which are two street car tracks, one 6-ft. sidewalk, floors and all woodwork of treated kedrone construction. J. G. Chalfant, Allegheny County, engineer in Pittsburgh, and William Wylie, Washington, Pa., are the engineers from whom particulars can be had.

The Board of County Commissioners of Jasper and Porter counties, meeting at Rensselaer, Ind., will receive bids until January 12 for the construction of an iron bridge over the Kankakee River. J. H. Leatherman, Jasper County, is auditor.

Foundries.

The Jackson Brass Foundry Company, Jackson, Mich., recently organized by R. P. Bauer and J. Van Walkenburg, has equipped a plant at 111 East Cortland street, for the manufacture of high grade brass and aluminum castings.

The Auburn Foundry Company, Auburn, Ind., has begun work on its new foundry. The principal product is automobile castings. The company also does considerable jobbing work.

The York Mfg. Company, York, Pa., has begun the construction of a large malleable iron foundry. The company has a

number of orders on its books which were held up pending the outcome of the election.

The Clifton Forge Machine & Foundry Company, Clifton Forge, Va., has been incorporated, with a capital stock of \$25,000, to manufacture iron and brass castings. The company has an established plant. C. H. Smith is president; L. B. Smith, vice-president, and B. C. Goodwin, secretary and treasurer.

Power Plant Equipment.

The Choctawhatchee River Light & Power Company, Dothan, Ala., has been incorporated, with an authorized capital stock of \$1,000,000, of which \$500,000 is paid in, for the purpose of developing water power on the Choctawhatchee River in Dale County to generate electric current. The officers are: President, A. J. Smith; vice-president and general manager, G. S. Kelley; secretary, W. C. Fritter; treasurer, A. L. Kelley.

Arrangements are being made for the construction of an electric light plant at Mackay, Idaho, by the Lost River Light & Power Company. Power for the operation of this plant will be developed from the waters of Cedar Creek.

A fund of \$7100 has been provided by the town of Chandler, Ill., through the sale of bonds, for the installation of an electric light plant. W. D. Super, city clerk.

The North Adams Gas Light Company, North Adams, Mass., has decided to erect a new power plant of about 4000 hp. capacity, at an estimated cost of \$100,000.

The Board of Public Works, Grand Rapids, Mich., will receive bids until November 19 for a vertical triplex expansion pumping engine of 12,000,000 gal. capacity, and until November 27 for sewerage pumping machinery, consisting of four 40-in., four 24-in. and two 18-in. centrifugal pumps, four 175-hp., two 75-hp., two 60-hp. and three 30-hp. electric motors, vacuum pumps, piping, &c.

The Huntington Light & Power Company, Huntington, N. Y., will double its generating capacity by the installation of a 500-kw. turbine, to pay for which an issue of \$50,000 in bonds will be made. Edgar L. Street, 43 Cedar street, New York, is manager.

The Electric Metals Company, 217 South Twenty-fourth street, Philadelphia, Pa., has incorporated, with a capital stock of \$30,000, to produce lead under a new process giving it a degree of temper for journal bearings and for making type. The company's plant is already equipped to turn out 2 tons per day, with room to extend the furnace to a capacity of 50 tons per day. A. S. Dickinson is president and general manager; N. W. Akimoff, secretary; H. H. Sturch, treasurer, and S. P. Hutchinson, metallurgist.

The town of Baldwin, Kan., has voted a \$35,000 bond issue for the purpose of building a municipal water works plant.

The Geneva-Seneca Electric Company, Geneva, N. Y., is about to build a new power house, contract for the construction of which has been awarded to the DeLaney-Roberts Construction Company, New York. The building will be 75 x 100 ft., of reinforced concrete construction, and will be equipped with a vertical steam-turbo generating set, water tube boilers, condensers, pumps, &c., with capacity of 1000 hp.

The Balance-Pressure Rotary Engine Company has been incorporated at Buffalo, with a capitalization of \$50,000, to manufacture an improved rotary engine, the invention of William M. Hoffman. The company has secured manufacturing quarters, already equipped with necessary machinery, in the Day Manufacturing Building, Letchworth and Grant streets, in conjunction with the Multi-Stage Rotary Engine Company. Later the company will provide additional machinery and equipment as required.

Fires.

The foundry of the National Mfg. Company at Pembroke, Ont., was destroyed by fire November 4.

The plant of the Nashville Saddlery Company, Nashville, Tenn., was burned November 6, the loss being about \$75,000.

Hardware.

Reports that Emerson Smith & Co., saw manufacturers, Beaver Falls, Pa., had started up their factory in full are slightly exaggerated. The plant has been operating right along, though not to full capacity, and is still running in that way.

M. V. Elliot of Bellefontaine, Ohio, has been seeking a suitable location in the West for the establishment of a woven wire fence factory. Points in Oklahoma and Arkansas have been under consideration, but no decision has as yet been reached.

The Burlington Willow Ware Shop, an organization subsidiary to the Burlington Basket Company, Burlington, Iowa, has taken new quarters affording better facilities and a larger output of its line of willow baskets and fancy colored straw braid baskets and furniture. A three-story and basement building, 60 x 100 ft., in the heart of the city, with a 30 x 80 wing, is wholly occupied as a factory.

Business with the Lenox Shear Company, Brookfield, Conn., has outgrown the former manufacturing facilities of the company and accordingly the plant has lately been materially enlarged. A new tempering and hardening plant, up to date in every respect, has also been installed.

The Wilder Metal Coating & Mfg. Company, W. J. Wilder,

president, Connellsville, Pa., has succeeded the American Aluminum Coating Company. The company manufactures hot process non-corrosive metal, such as aluminum coated iron and steel sheets, wire, nails, pipe and aluminum alloy sheet metal for spun ware. It has lately installed a 10-ft. pot and is making some other improvements in the plant.

The Bergman Hardware & Tool Mfg. Company, Buffalo, N. Y., has purchased a site on Niagara street and will at once erect an up to date three-story reinforced concrete factory building, 42 x 170 ft., and equip it with a full line of modern machinery for the manufacture of its specialties, pliers, tap wrenches, corner bit braces, saw sets and kindred tools. It is expected the new plant will be completed and ready for operation March 1. S. Bergman, president of the company, will withdraw from the firm of Bergman Bros. hardware merchants, January 1, and devote his entire attention to the business of the tool company. His son, Jerome Bergman, will also be taken into the company.

The Buffalo Sled Company, which manufactures sleds, steel shovels, &c., has taken over the business and the three-story brick factory of the Orient Novelty Company, North Tonawanda, N. Y., and will remove its plant from the Ross Mfg. Building, Buffalo, to that point. Hereafter, in addition to producing its own special lines, the company will manufacture the line of Morris chairs, patented tables, &c., made by the Orient Novelty Company prior to the consolidation.

The Republic Metalware Company, Buffalo, N. Y., will erect a one-story brick addition to its plant.

Miscellaneous.

The Western Cartridge Company, East Alton, Ill., is negotiating for a new site for its business. Locations in several Western cities have been offered, but no decision has as yet been reached concerning the removal of the plant.

The Springfield & Jacksonville Railway Company, Springfield, Ill., capitalized at \$100,000, is preparing to build an interurban line about 33 miles in length, connecting that city with Jacksonville, Ill. Arrangements for financing this enterprise, it is stated, have already been made.

The Packard Motor Car Company, Detroit, whose present factory covers an area of about 14 acres, has under way some new additions, which include a new factory room for the manufacture of the Packard 3-ton truck recently introduced.

The Ingraham-Richardson Mfg. Company, Beaver Falls, Pa., has let contract for the construction of a brick and steel addition to its plant, 75 x 129 ft., two stories, the structural steel for which will be furnished by the Penn Bridge Company of Beaver Falls. Contracts for the equipment will be placed later, but the machinery requirements will be rather small as the new building will contain an enameling room, tapping room and packing room, which require but little mechanical equipment. Later the company expects to be in the market for an elevator and probably a small amount of other machinery.

The Great Northern Portland Cement Company's property and business has been taken over by the newly organized Great Lakes Portland Cement Company, Mariborough, Mich., by which, under arrangements made with the Board of Commerce of Charlevoix, Mich., the Mariborough plant will be moved to Charlevoix. The old company finding the operation of its works at Mariborough unprofitable, on account of the remoteness from rock quarries and consequent expense of transportation, finally went into the hands of a receiver. The factory will have an initial output of 2500 bbl. per day.

The John R. Keim Mills, Buffalo, N. Y., manufacturer of automobile and bicycle parts and supplies, will add to the present plant at Kensington avenue and the Erie Railroad a one-story brick building for press and furnace uses.

The Gould Coupler Company, Depew, N. Y., is inclosing and roofing with steel truss roof its electric crane runway, about 500 ft. in length, forming a storage warehouse. The company is also completing a fireproof pattern vault, 63 x 222 ft., equipped throughout with steel shelving for holding the patterns.

The Carley Heater Company, Olean, N. Y., has been awarded contract for about \$30,000 of machinery by the William F. Mosser Company, Boston, to be installed in a tannery which the latter company is erecting at Richmond, W. Va.

The Calmon Asbestos & Rubber Works of America, 100 Reade street, New York, has opened an office at 524 Penn avenue, Pittsburgh, in charge of Charles F. Belts. The company manufactures a complete line of asbestos packings, including a compressed asbestos gasket with a copper vein forcement and an asbestos metal reinforced stuffing box packing, consisting of several strands of pliable alloy covered with an asbestos cushion inclosed in a woven metallic cover. An indestructible armored steam hose with an asbestos inner tube, which will not vulcanize and is guaranteed to stand a steam pressure of 200 lb., is another product of the company.

The Glen Mfg. Company, Ellwood City, Pa., manufacturer of ornamental ironwork, wire mats, wire fencing, &c., has run its plant to nearly full capacity during the past year and has a fair number of orders on its books at present. The company is filling orders as follows: Elevator inclosures and staircases

for the Marine Hospital, Penn avenue, Pittsburgh; stair work, Civic Club house, Fifth avenue, Pittsburgh; stair work, Carnegie Library, Homewood District, Pittsburgh; ornamental ironwork, Liberty National Bank, Pittsburgh; fireproof porch, Amelia Brererton apartment, Pittsburgh; ornamental ironwork, Williams Building, Liberty avenue and Market street, Pittsburgh; ornamental ironwork and stair work, Rosalia Maternity Hospital, Pittsburgh; ornamental ironwork and fire escapes, St. John's Hospital, North Side, Pittsburgh, and the ornamental ironwork for the Fourteenth Ward engine house, Pittsburgh.

The Dain Mfg. Company, Canadian branch, Preston, Ont., L. D. Koser, manager, is considering erecting a plant at Bridgeburg, Ont., for the manufacture of haying machinery.

At a meeting of the stockholders of the Pittsburgh Emery Wheel Company, held in the Park Building, Pittsburgh, November 7, the directors were instructed to increase the capital stock from \$50,000 to \$75,000.

The plant of the United States Metals Refining Company at Grasselli, Ind., which was closed during the summer months owing to the shutting down of the lead supply in the West, is running full capacity again, turning out daily 75 tons of a pure grade of refined lead. Besides the heavy production of the parent company's own smelters, the refinery is doing a large amount of custom work, bullion being received from smelters from all parts of the United States. The Grasselli refinery is the first one in the United States to work under what is known as the Betts patents, the only other two refineries using the same process being the plant at Trail, B. C., and one recently erected at Newcastle-on-Tyne, England. The process used meets the growing demands for pure lead by the corrodors and allows a more complete recovery of the by-products, such as antimony, copper and bismuth, the latter becoming completely eliminated, a feature said to be never before attained by any refining process. The electrolytic lead refinery, operating under the name of the United States Metals Refining Company, a subsidiary organization of the United States Smelting, Refining & Mining Company, has been in successful operation at Grasselli for about three years. The company reports trade conditions improving.

The Strength of Riveted Joints.

A lecture on this subject delivered by J. W. Rausch, superintendent of the Maryland Casualty Company's inspection division, has been reprinted in pamphlet form by that company for distribution to those interested. The author discusses the standard forms of riveted joints, including single, double and triple riveted lap joints and double and triple riveted butt joints. In discussing each he shows the manner in which it may fail; that is, by the sheet tearing apart, the rivets shearing, the plate in front of the rivet hole being crushed, the plate sheared through by the rivets, or a combination of one or more of these sources of failure. He explains how to calculate the efficiency of the different features of each joint so that it may be possible to design a joint of equal strength in all respects. The calculations are gone into very thoroughly in each instance, both by general formulae and typical numerical examples as applied. Those who are concerned with riveted plate work will find this pamphlet a valuable one to preserve for reference, as such knowledge is rarely found outside of expensive text books, especially from the pen of so reliable an authority.

The United States Circuit Court of Appeals, New York, rendered a decision November 7 in the case of the bill of complaint of the United States Government against the American Tobacco Company. The application for a receivership, which was the sensational feature of this suit, was denied as unnecessary and unreasonable. The Government was sustained in its demand for judgment, declaring the company a combination in restraint of trade, the majority of the court agreeing, on the sweeping ground that under the Sherman Anti-Trust law the merger of any two business enterprises doing interstate trade is in restraint and is prohibited, regardless of any of the acts or consequences of the combination. The issuance of an injunction was postponed until the appeal of the company to the Supreme Court shall have been disposed of. The appeal is to be taken speedily.

The Riter-Conley Mfg. Company, Pittsburgh, builder of steel plate construction of all kinds, has received a contract from the St. Clair County Gas & Electric Company, East St. Louis, Ill., for the building of a gas holder of 1,000,000 cu. ft. capacity.

The Iron and Metal Trades

Heavy Buying of Pig Iron.

A Better Feeling in All Branches.

Absurd exaggeration characterizes many of the statements current in regard to the improvement which has taken place in the iron trade, and in regard to the prospects for the winter. There has been a large buying movement, with advancing prices in Pig Iron, in practically all sections of the country. So far as can be judged, consumers have based their purchases, in most cases, as to quantity, upon the rate at which they have been melting recently. Many of them frankly admit that they themselves have not the orders ahead for delivery until spring, from their own customers. They are simply covering what they believe will be their minimum requirements because prices have been fairly low and safe.

In the aggregate, the buying has been large, and has covered all grades. It has included early deliveries, the first quarter and the first half. It is extremely difficult to estimate the whole volume, but there have been very many blocks of 5000, 8000 and 10,000 tons. Consumers in all branches have bought, including the general foundry trade, the Cast Iron Water and Soil Pipe makers, the locomotive and car builders, the stove founders and radiator manufacturers, machinery builders, Steel works and forges. There appears, too, to have been some speculative buying.

There is still a good deal of inquiry with negotiations for large lots pending, so that the movement has not yet exhausted itself. Prices are higher, and at least in one conspicuous instance the rapid rise led to the withdrawal of the buyers before the greater part of the purchases in view had been made. The advance in prices has been most conspicuous in the Central West, where they were relatively lower than in any other section three weeks since when the buying movement set in. An increasing number of sellers have withdrawn former prices, and for the present are out of the market except at an advance.

There has been quickened buying in many lines in which jobbers and the trade generally have been bare of stocks, but in the branches of the finished trade in which prices have been maintained there is little inducement to increase commitments because there is no indication of nor any desire to advance prices.

There is much room for improvement in prices in fabricated Structural Material, and efforts are being made to get at the root of the evil.

There has been more inquiry for Steel Rails, the Chicago market reporting about 70,000 tons, which probably includes 40,000 tons for the Chicago, Burlington & Quincy. The Maryland Steel Company has taken an order for 25,000 tons for the Atlantic Coast Line, and one Western road has placed 10,000 tons on an old contract.

In the Plate trade the event of the week is the placing of the order for 20,000 tons for the Brooklyn Steel Water Pipe.

Some round tonnage of Structural Material has been again secured from car builders. The latter are also taking Steel for Car Axles, one lot of 8000 tons of Axle Billets having been closed in the Chicago District. There has just been ordered a new Steel boat for the lakes, for which the material is under negotiation.

The bookings of Structural Steel include 4700 tons for New York Central yard work, 5300 tons for the Blackstone Hotel at Chicago and 3350 tons for two public buildings at St. Louis.

Old Material is stiffer and some very big business is in sight. There has been a scramble in Copper and 14½c. has been paid for Electrolytic and 14¼c. for Lake. The juggling of the metal to suit stock gambling on both sides of the Atlantic is again a feature. The trade has long since lost faith in some of the leading selling interests, and will keep the one cardinal fact in mind that production is going on at a record rate, while consumption is still considerably below normal.

The second reduction in the price of Aluminum in the last month has just been announced. No. 1 Aluminum Ingots were put down from 33c. to 29c. recently, and to 25c. now. The metal is selling at 15c. a pound in Europe.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

Nov. 11, Nov. 4, Oct. 14, Nov. 13,
1908. 1908. 1908. 1907.

PIG IRON, Per Gross Ton:
Foundry No. 2, Standard, Philadelphia \$17.00 \$16.75 \$16.75 \$19.00

Foundry No. 2, Southern, Cincinnati 15.75 15.75 15.75 19.75

Foundry No. 2, Local, Chicago... 16.50 16.50 16.50 20.50

Basic, delivered Eastern Pa.... 16.00 16.00 15.50 18.00

Basic, Valley Furnace..... 14.50 13.90 14.00 18.00

Bessemer, Pittsburgh..... 16.40 15.65 15.90 20.90

Gray Forge, Pittsburgh..... 14.90 14.40 14.40 19.40

Lake Superior Charcoal, Chicago 19.50 19.50 19.50 25.00

BILLETS, &c., Per Gross Ton:

Steel Billets, Pittsburgh..... 25.00 25.00 25.00 28.00

Forging Billets, Pittsburgh..... 27.00 27.00 27.00 30.00

Open Hearth Billets, Phila.... 26.20 26.20 26.20 30.00

Wire Rods, Pittsburgh..... 33.00 33.00 33.00 34.00

Steel Rails, Heavy, at mill.... 28.00 28.00 28.00 28.00

OLD MATERIAL, Per Gross Ton:

Steel Rails, Melting, Chicago... 15.00 14.50 14.75 15.50

Steel Rails, Melting, Phila.... 15.50 15.25 15.00 13.50

Iron Rails, Chicago..... 18.00 18.00 18.00 19.00

Iron Rails, Philadelphia..... 20.25 19.75 19.50 19.00

Car Wheels, Chicago..... 15.25 15.25 15.25 23.00

Car Wheels, Philadelphia..... 15.00 15.00 15.00 19.00

Heavy Steel Scrap, Pittsburgh.. 16.00 15.50 15.25 15.00

Heavy Steel Scrap, Chicago.... 14.50 14.50 13.50 12.50

Heavy Steel Scrap, Philadelphia 15.50 15.25 15.00 13.50

FINISHED IRON AND STEEL,

Per Pound: Cents. Cents. Cents. Cents.

Refined Iron Bars, Philadelphia. 1.45 1.45 1.45 1.75

Common Iron Bars, Chicago.... 1.50 1.50 1.50 1.75

Common Iron Bars, Pittsburgh. 1.40 1.40 1.40 1.70

Steel Bars, Tidewater, New York 1.56 1.56 1.56 1.76

Steel Bars, Pittsburgh..... 1.40 1.40 1.40 1.60

Tank Plates, Tidewater, New York 1.76 1.76 1.76 1.86

Tank Plates, Pittsburgh..... 1.60 1.60 1.60 1.70

Beams, Tidewater, New York... 1.76 1.76 1.76 1.86

Beams, Pittsburgh..... 1.60 1.60 1.60 1.70

Angles, Tidewater, New York... 1.76 1.76 1.76 1.86

Angles, Pittsburgh..... 1.60 1.60 1.60 1.70

Skelp, Grooved Steel, Pittsburgh 1.45 1.45 1.45 1.70

Skelp, Sheared Steel, Pittsburgh. 1.50 1.50 1.50 1.80

SHEETS, NAILS AND WIRE,

Per Pound: Cents. Cents. Cents. Cents.

Sheets, Black, No. 28, Pittsburgh. 2.50 2.50 2.50 2.60

Wire Nails, Pittsburgh..... 1.95 1.95 1.95 2.05

Cut Nails, Pittsburgh..... 1.75 1.75 1.80 2.00

Barb Wire, Galv., Pittsburgh... 2.40 2.40 2.40 2.50

METALS, Per Pound: Cents. Cents. Cents. Cents.

Lake Copper, New York..... 14.75 14.00 13.75 14.25

Electrolytic Copper, New York. 14.50 13.75 13.37½ 13.50

Spelter, New York..... 5.05 4.90 4.77½ 5.15

Spelter, St. Louis..... 4.90 4.80 4.62½ 5.00

Lead, New York..... 4.42½ 4.35 4.35 4.55

Lead, St. Louis..... 4.30 4.30 4.20 4.35

Tin, New York..... 30.75 30.37½ 29.25 30.75

Antimony, Hallett, New York... 8.12½ 8.00 7.75 10.00

Nickel, New York..... 45.00 45.00 45.00 45.00

Tin Plate, 100 lb., New York... \$3.89 \$3.89 \$3.89 \$4.09

Chicago.

FISHER BUILDING, November 11, 1908.—(By Telegraph.)

While it is true that there is this week a decided improvement in the general tone of business, it has not resulted in any phenomenal quickening of trade. For some time steady progress has been made toward betterment in financial and industrial conditions, and with the distracting issues of the late political campaign out of the way, it is fair to expect a better forward movement, but there is nothing in the present situation to warrant the extravagantly exaggerated reports of shops and factories suddenly filled to full capacity with an avalanche of orders, that have, since the election, occupied a prominent place in general press news. As a matter of fact, business in all lines is expanding in a conservative way that augurs well for its re-establishment upon a safe normal basis at no distant day. An increased number of new car orders is being placed by the railroads, and repair work is being vigorously pushed. An order for 300 Hart convertible cars with Steel under frames has been placed by the Union Pacific Railroad with the Rogers Ballast Car Company, Detroit. The Ralston Steel Car Company has secured an order for 1000 Steel under frames from the Erie Railroad, and a number of the leading Western roads are placing orders with outside shops for the repair of cars in lots ranging from a few hundred up to 2500 and more cars. The extension of such work naturally means the fuller employment of finishing mill capacity. Coincident with the announcement that Rail prices for 1909 will remain un-

changed at \$28 for Bessemer and \$30 for Open Hearth, it is reported that about 70,000 tons of Standard Section Rails are under negotiation in this market. The actual necessities of the roads are compelling heavier purchases of supplies, and orders for Spikes and Bolts show considerable improvement.

Pig Iron.—A review of last week's trading affords reassuring evidence of conservative action in the development of business. While there was no general rush of buying immediately after election, quite a number of moderate contracts were closed for first half delivery. The business was well scattered, and the aggregate closed through local sales agents amounted to about 35,000 tons. No individual lots of Foundry Iron above 3000 tons are reported as included in this total. Southern Iron shared more liberally in last week's business, there being around 12,000 tons placed by various furnaces. One of the leading Alabama producers reported sales amounting to 5000 tons, and another 2000 tons, all at \$13, Birmingham, for No. 2, for first half delivery. This price is being uniformly held on all deliveries beyond the first of the year, and the sources from which \$12.50 iron is obtainable are now few. Under the influence of better demand and prospective improvement, Northern Iron is being held somewhat firmer. The low point for furnaces in this district seems to have been reached in the sale made by a Wisconsin company on the day before election of 20,000 tons of High Phosphorus Iron to an agricultural implement company; this, at \$16.25, Chicago, on a 75c. freight rate, netted \$15.50, at the furnace, covering deliveries through to July next. On shipments for this period, one of the leading Northern interests has advanced its price to \$17.50, but its lead has not been followed by other producers, who are asking \$17, at furnace; and it is likely that offers of desirable tonnage would not be declined at a shade under this price. A local Steel maker has an inquiry out this week for 5000 tons of Basic. The feeling is general that there is definite improvement in the entire industrial situation, but at the same time there is nothing to indicate that anything like a boom is at hand. The following quotations are for November and December delivery, f.o.b. Chicago:

Lake Superior Charcoal.....	\$19.50 to \$20.00
Northern Coke Foundry, No. 1.....	17.00 to 17.50
Northern Coke Foundry, No. 2.....	16.50 to 17.00
Northern Coke Foundry, No. 3.....	16.00 to 16.50
Northern Scotch, No. 1.....	17.50 to 18.00
Southern Coke, No. 1.....	17.35 to 17.85
Southern Coke, No. 2.....	16.85 to 17.35
Southern Coke, No. 3.....	16.35 to 16.85
Southern Coke, No. 4.....	15.85 to 16.35
Southern Coke, No. 1 Soft.....	17.35 to 17.85
Southern Coke, No. 2 Soft.....	16.85 to 17.35
Southern Gray Forge.....	15.35 to 15.85
Southern Mottled.....	15.10 to 15.60
Malleable Bessemer.....	17.00 to 17.50
Standard Bessemer.....	16.90 to 17.40
Jackson Co. and Kentucky Silvery, 6 %	19.90 to 20.40
Jackson Co. and Kentucky Silvery, 8 %	20.90 to 21.40
Jackson Co. and Kentucky Silvery, 10 %	22.90 to 23.40

(By Mail.)

Billets and Rods.—A number of inquiries for Forging Billets, ranging from 200 to 500 tons, have appeared in the market, and the outlook for improved business in this line is encouraging. As a result of recent orders placed for new cars there is more demand for Axle Billets. It is understood that the Standard Steel Company has placed an order for about 8000 tons required to make up 25,000 Axles. The actual requirements of the Chicago, Milwaukee & St. Paul Railroad for the last allotment of 5000 cars to be built in its Milwaukee shops have not yet been placed; these, it is understood, are to be of Iron. The regular price of \$28.50, Chicago, for Forging Billets remains unchanged, and is reported to be fairly firm. The continued strength of Wire products is reflected in an increased amount of new business and specifications for Wire Rods. We are advised that the schedule of prices is being strictly adhered to, as follows: Bessemer, \$33; Basic, \$34; Chain, \$33, all at Pittsburgh.

Rails and Track Supplies.—Announcement is made that prices on Standard Section Rails for 1909 delivery have been established by reaffirmation of the price schedule of last year, which is based on \$28 a ton for Bessemer Rails. The rumor of a \$4 cut on Rails, which gained wide circulation in the past few days, seems, therefore, to be wholly erroneous. It is stated that there are inquiries out for between 60,000 and 70,000 tons of Rails from leading Western roads for next year's delivery; but, as far as can be learned, no part of this tonnage has yet been placed. There is a decidedly better demand for Spikes and Bolts from nearly all lines, of which the Burlington, the Northwestern and the St. Paul roads were the leading buyers. The general attitude of the railroads respecting purchases of material encourages the belief that continued improvement may be expected in market activities touched by these interests. The movement in Light Rails is fully maintained, the volume of miscellaneous orders bringing the aggregate tonnage up to a fairly satisfactory point. No change is noted in Light Rail prices, which, though considerably firmer than they were earlier in the season, are still being shaded \$1 a ton. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c.; Spikes, 1.80c. to

1.90c., according to delivery; Track Bolts, 2.15c. to 2.20c., base, Square Nuts, and 2.30c. to 2.35c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., \$26; 20-lb., \$27; 16-lb., \$28; 12-lb., \$29. Standard Sections, Bessemer, \$28; Open Hearth, \$30, on lots of 500 tons and over; on smaller lots, \$2 a ton extra.

Structural Material.—The final award of the contract for the construction of the new City Hall, involving 11,000 tons of Structural Shapes, has not yet been made. It is understood that the 3000 tons required for the Blackstone Hotel will be fabricated by the Brown-Ketcham Iron Works, Indianapolis. Figures are in on the Steel approaches to the McKinley Bridge, at St. Louis, which will take a minimum of 1600 tons of a maximum of 2400. Specifications for 4000 tons against a total of 5000 for Santa Fe bridges have been received by the American Bridge Company. An order for 480 tons to be used in the construction of the Mission Grammar School, San Francisco, went to Dyer Brothers of that city. The St. Paul Bridge & Terminal Railway, St. Paul, Minn., is in the market with an inquiry for 900 tons. A fair amount of small contracts was included in the week's transactions, which in the aggregate produced only a moderate tonnage. A feeling prevails, however, that there will be less hesitancy in the placing of orders for the projects now under negotiation. Prices from store are 1.95c. to 2c. Mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.78c.; Angles, 3 to 6 in., 1/4-in. and heavier, 1.78c.; larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 15 in., 1.88c.; Zees, 3 in. and over, 1.78c.; Tees, 3 in. and over, 1.83c.

Plates.—What new business has been entered in the past week was comprised of small lots representing immediate requirements. Some betterment in the demand for Plates is looked for as a result of prospective activity in new Steel car construction promised by inquiries for such work now in the market. Other sources of supply, such as boiler and tank shops, are still inactive. But little irregularity in price is reported except on the narrow sizes, which continue to be shaded from \$1 to \$2 per ton. We quote mill shipments as follows: Tank Plates, 1/4-in. and heavier, wider than 6 1/4 and up to 100 in. wide, inclusive, car lots, Chicago, 1.78c.; 3-16 in., 1.88c.; Nos. 7 and 8 gauge, 1.93c.; No. 9, 2.03c.; Flange quality, in widths up to 100 in., 1.88c., base, for 1/4-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.88c.; Flange quality, 1.98c. Store prices on Plates are as follows: Tank Plates, 1/4-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.25c.; 72 in. wide, 2.30c. to 2.40c.; No. 8, up to 60 in. wide, 2.10c. to 2.15c.; Flange and Head quality, 0.25c. extra.

Sheets.—As respects the actual volume of business developed, the past few days has brought no noticeable change in the situation. There is, however, a tendency to buy a little more liberally. A fairly good demand for Galvanized and Light Black Sheets is coming from both manufacturers and jobbers, but the heavier gauges of Black Sheets are comparatively quiet. While concessions of \$1 to \$2 a ton are still being made by some mills, the general tendency is toward greater firmness. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.15c.; No. 12, 2.20c.; No. 14, 2.25c.; No. 16, 2.35c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—A noticeable feature in the demand for Bars is that manufacturers of railroad equipment and supplies are becoming a more important factor in the market. Orders from these interests have increased considerably, and, coupled with continued heavy specifications from the implement makers, are producing a tonnage sufficient to keep mills of the leading interest in active operation at full capacity. The independent mills are also better supplied with specifications, but are not yet able to keep all their mills going full time. The extension of car repair work has increased the demand for Iron Bars somewhat, but not enough as yet to keep them fully engaged. Quotations, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13, and lighter, 1.98c., full extra Hoop card; Bands, No. 12 gauge, and heavier, 1.58c., half extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

Merchant Pipe.—The movement of Merchant Pipe con-

tinues to be controlled by present or nearby requirements of the jobbers. Prompt execution of orders favors dependence upon prompt shipment for maintenance of stock assortments, which can thus be made to meet current demands without materially increasing stocks. The general tendency, however, is toward an increasing volume of business. Mill prices are said to be firmly held. The following mill discounts are quoted: Black Pipe, $\frac{3}{4}$ to 6 in., 73.2; 7 to 12 in., 70.2; Galvanized, $\frac{3}{4}$ to 6 in., 63.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 73 per cent. on Black Steel Pipe, $\frac{3}{4}$ to 6 in. About three points above these prices is asked for Iron Pipe.

Boiler Tubes.—What betterment there is in the demand comes chiefly from the growing needs of the railroads in Locomotive Tubes. While observable improvement is observed in this direction, it has not by any means brought the market up to a normal state of activity. Merchant Tubes show little, if any, gain, and in addition to the unsatisfactory volume of business some deviation from the regular schedule of discounts is reported. Mill quotations for future delivery, on the base sizes, are as follows: 2 $\frac{3}{4}$ to 4 $\frac{1}{4}$ in., inclusive, Steel Tubes, 63.2; Iron, 50.2; Seamless, 50.2; 2 $\frac{1}{2}$ in. and smaller, and lengths over 18 ft., and 2 $\frac{1}{2}$ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1 $\frac{1}{2}$ in.....	35	35	35
1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ in.....	50	35	35
2 $\frac{1}{2}$ in.....	52 $\frac{1}{2}$	35	35
2 $\frac{3}{4}$ to 5 in.....	60	47 $\frac{1}{2}$	47 $\frac{1}{2}$
6 in. and larger.....	50	35	..

Merchant Steel.—More active work in car building and repair shops is responsible for a better demand for railroad Spring Steel. Jobbers are also buying more freely and specifications from the implement makers and others manufacturers are fairly satisfactory. We quote as follows: Planished or Smooth Finished Tire Steel, 1.78c.; Iron Finish, up to 1 $\frac{1}{2}$ x $\frac{1}{2}$ in., 1.73c., base, Steel card; Iron Finish, 1 $\frac{1}{2}$ x $\frac{1}{2}$ in. and larger, 1.58c., base, Tire card; Channels for solid Rubber Tires, $\frac{3}{4}$ to 1 in., 2.08c., and 1 $\frac{1}{2}$ in. and larger, 1.98c.; Smooth Finished Machinery Steel, 2.08c.; Flat Sleigh Shoe, 1.63c.; Concave and Convex Sleigh Shoe, 1.83c.; Cutter Shoe, 2.05c.; Toe Calk Steel, 2.13c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7 $\frac{1}{4}$ c. to 8c., and still higher prices are asked on special grades. Cold Rolled Shafting on contracts for 100 tons and over 57 per cent. off; 56 per cent. off in car lots; 52 per cent. in less than car lots, on which carload freight is allowed within base territory.

Metals.—While the actual consumption of Copper has not increased notably, the firmer tone in values led to considerable buying in the past week or two for anticipated wants covering a period of 60 days and in some cases three months ahead. The slight advances realized under this movement are being held with reasonable firmness. Other metals are in fairly good demand, and the entire situation is strengthened by a feeling of greater confidence. Quotations are as follows: Casting Copper, 14c.; Lake, 14 $\frac{1}{4}$ c. to 14 $\frac{1}{2}$ c., in car lots, for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{4}$ c. higher; Pig Tin, car lots, 32 $\frac{1}{2}$ c.; small lots, 34 $\frac{1}{2}$ c.; Lead, Desilverized, 4.55c. to 4.65c., for 50-ton lots; Corroding, 4.80c. to 4.90c., for 50-ton lots; in car lots, 2 $\frac{1}{4}$ c. per 100 lb. higher; Spelter, 4.90c.; Cookson's Antimony, 10 $\frac{1}{2}$ c., and other grades, 9 $\frac{1}{4}$ c. to 10 $\frac{1}{4}$ c.; Sheet Zinc is \$7, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13 $\frac{3}{4}$ c.; Heavy Copper, 13 $\frac{1}{2}$ c.; Copper Bottoms, 12 $\frac{1}{4}$ c.; Copper Clips, 13 $\frac{1}{2}$ c.; Red Brass, 12 $\frac{3}{4}$ c.; Yellow Brass, 10c.; Light Brass, 7c.; Lead Pipe, 4.35c.; Zinc, 3 $\frac{1}{4}$ c.; Pewter, No. 1, 21c.; Tin Foil, 24c.; Block Tin Pipe, 26c.

Cast Iron Pipe.—The principal lettings advertised for this week are 3500 tons by the city of Detroit and 4000 tons by the city of Milwaukee. Last week's business included no noteworthy transactions, being made up chiefly of routine orders, which were about on a par with those of recent weeks. We quote nominally per ton, Chicago, as follows: Water Pipe, 4 in., \$27; 6 to 12 in., \$26; 16 in. and up, \$25, with \$1 extra for Gas Pipe.

Old Material.—Despite the fact that there have been no heavy purchases by the consuming interests, prices of Old Material hold firm, with advances on several grades. Most of the railroad Scrap offered last week again brought top prices and in some instances sales were made at a premium over current quotations. This was notably true of Rerolling Steel Rails, one lot having been closed at \$17.50. Railroad Malleable was sold at \$13.50, and as high as \$15.50 is reported to have been paid for No. 1 Railroad Wrought; the latter transaction, however, is not regarded as reflecting the actual market. A large part of the Scrap offered was taken by dealers, who say that no difficulty is experienced in disposing of all that is coming out to consumers. One of the factors which influences dealers in their bullish attitude is the belief that some of the large consumers who have not been buying for some time are about ready to enter the market. The outlook for

an increased consumption of Heavy Melting Steel is particularly bright, and for this reason prices are firm; last week's quotations on this item were inadvertently advanced \$1 instead of 50c., and should have read \$14.50 to \$15., which are the prevailing prices at this time. Over 14,000 tons will be offered by the railroads this week, the lists out being as follows: Chicago, Milwaukee & St. Paul, 1600 tons; Northern Pacific 3000 tons, including 1200 tons of Wrought; Santa Fe, 2200 tons; Baltimore & Ohio 7300 tons, in which there are 2000 tons of Rerolling Steel Rails, and the Wisconsin Central, 300 tons. The following prices are per gross ton, f.o.b. Chicago:

Old Iron Rails.....	\$18.00 to \$18.50
Old Steel Rails, rerolling.....	17.00 to 17.50
Old Steel Rails, less than 3 ft.....	15.00 to 15.50
Relaying Rails, standard sections, subject to inspection.....	22.50 to 23.50
Old Car Wheels.....	15.25 to 15.75
Heavy Melting Steel Scrap.....	14.50 to 15.00
Frogs, Switches and Guards, cut apart.....	14.25 to 14.75
Mixed Steel.....	10.25 to 10.75

The following quotations are per net ton:

Iron Fish Plates.....	\$17.00 to \$17.50
Iron Car Axles.....	20.00 to 20.50
Steel Car Axles.....	17.75 to 18.25
No. 1 Railroad Wrought.....	14.25 to 14.75
No. 2 Railroad Wrought.....	13.25 to 13.75
Railway Springs.....	14.25 to 14.50
Locomotive Tires, smooth.....	14.50 to 15.00
No. 1 Dealers' Forge.....	11.00 to 11.50
Mixed Busheling.....	8.25 to 8.75
Iron Axle Turnings.....	8.00 to 8.50
Soft Steel Axle Turnings.....	8.00 to 8.50
Machine Shop Turnings.....	8.00 to 8.50
Cast Borings.....	7.00 to 7.50
Mixed Borings, &c.....	7.00 to 7.50
No. 1 Mill.....	8.00 to 8.50
No. 2 Mill.....	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings.....	10.00 to 10.50
No. 1 Cast Scrap.....	13.75 to 14.25
Stove Plate and Light Cast Scrap.....	12.25 to 12.75
Railroad Malleable.....	13.25 to 13.75
Agricultural Malleable.....	11.50 to 12.00
Pipes and Flues.....	10.50 to 11.00

Philadelphia.

PHILADELPHIA, PA., November 10, 1908.

Quite a heavy buying movement set in last week after the result of the election was known. In some few instances buyers had discounted the election, but the heaviest transactions came out the latter part of the week, buyers in many cases closing on quotations made just prior to the election. With this heavy buying, particularly in Foundry Irons, came an advance in prices in those grades ranging from 25c. to 50c. a ton. The situation in the crude material market, as well as some lines of finished materials, is much stronger. Confidence is being fast restored, and consumers are backing their opinions by orders. Increased business is coming to the mills, but hardly in the volume that one is led to believe from reports in the daily press. The trade expects a heavy forward movement for a time, after which it is believed there may be a slowing down, but not sufficient to affect prices to any extent, as sellers, particularly in Pig Iron, have their capacities for the near future pretty well sold ahead. After the first of the year a steady forward movement, leading up to normal conditions is anticipated, there being no doubt that all branches of the trade would be best served by such a gradual betterment, so that idle capacity in all directions could be gradually put in service and production increased in an orderly manner. The increased volume of railroad business placed recently is viewed with satisfaction, and it is believed that before very long a great deal more, particularly Rails for next year's delivery, will come out. Increased activity on the part of some of the shipyards as well as Steel mills, particularly Armor plate makers, is looked forward to, as both yards and mills in this territory are among the low bidders for a considerable amount of Government work of that class.

Pig Iron.—Melters have been somewhat slow in getting into the market, buyers for the greater part have been conservative, and while heavy inquiries were before the trade, not until after the result of election was known were orders placed to any marked extent. The volume of business taken during the closing days of the week was very heavy, but was confined almost entirely to Foundry grades. A number of round lots for delivery the balance of the year and extending into the first quarter of next were booked, not as large in a number of cases as buyers would have been willing to place, but sellers have the situation well in hand, and in many cases refused to accept the full tonnages offered by their customers. A large portion of the Foundry Iron sold was on the basis of \$17, delivered, for No. 2 X, and while a number of orders were taken on the basis of \$16.75 for this grade, it was mostly on quotations made early in the week. As far as we can learn there is now no standard No. 2 X Foundry to be had at the latter price, while \$17.25 to \$17.50 has been done on deliveries extending over into the next quarter. Some makers will not accept these figures for deliveries running through the first quarter, and are practically out of the market as far as Iron for the next three months

is concerned, and refuse to quote at present for deliveries beyond that date. Sales have been mostly in moderate sized lots running from 100 up to 1000 tons and in a few instances in larger amounts. Quite a good tonnage of No. 2 Plain Iron was sold at around \$16.50, delivered. The Cast Iron Pipe foundries have closed for some good round lots of Pipe Iron, one purchase of 10,000 tons being reported for delivery extending into the first quarter, while another lot of several thousand tons was taken. Sellers are pretty firm on prices for this grade, and while Pipe foundries are still in the market for heavy quantities, they are withholding orders, hoping that their view of prices may still be met. Virginia Foundry grades have been quite heavily sold, the bulk of the business going West, although several fair sized lots were sold to local and nearby melters. One producer disposed of an aggregate of 7000 tons and has now withdrawn from the market. Several other producers are pretty well sold up, and, while some refuse to quote, others are taking business at a slightly higher range of prices, particularly when delivery extends into the first quarter of next year. Southern Iron is decidedly strong, the recent price level having been firmly maintained, and higher prices are asked in a number of cases for forward deliveries. The business recently transacted in this territory, however, has been comparatively small. Forge Iron has not been active, and while there has been considerable inquiry the quantities sold have usually been small at unchanged prices, which, however, are decidedly firm. Steel makers have been testing the market pretty thoroughly, several inquiries for 5000-ton lots being out for early delivery and some for larger blocks for next year's delivery, but sellers are very firm on prices and no business has been closed. The market generally has a decidedly stronger tendency. A large number of inquiries for Foundry Iron are being quoted on, some running to heavy tonnages, and prices show an upward tendency. Makers who have been inclined to shade for prompt deliveries have marked up their prices and very little, if any, of the standard grades is to be had under the ruling quotations, which for delivery in buyers' yards, eastern Pennsylvania and nearby territory, range as follows for shipments extending over the balance of this and through the first quarter of next year:

Eastern Pennsylvania, No. 2 X Foundry.....	\$17.00 to \$17.50
Eastern Pennsylvania, No. 2 Plain.....	16.50 to 17.00
Virginia, No. 2 X Foundry.....	17.00 to 17.50
Virginia, No. 2 Plain.....	16.75 to 17.00
Gray Forge.....	15.50 to 15.75
Basic.....	16.00
Low Phosphorus.....	20.50

Ferromanganese.—The market has developed more activity. Sales for both forward and prompt delivery have been made. One lot of 1200 tons for delivery in November, December and January brought about \$43.50, Baltimore, and another of 500 tons for delivery during the first half of next year is reported at \$44.75, seaboard. There is still a wide range of prices, some sellers quoting \$44 to \$44.50 for prompt Ferro, while others name \$46, Baltimore, as the price for either prompt or forward shipments.

Plates.—Several of the mills in this district report the tonnage taken last week as the best for any single week for a long time. Orders so far this week continue on a very good basis. There is more disposition shown by buyers to make contracts covering future requirements, and the outlook for the future is considered much brighter. Specifications cover quite a variety of work, bridge, boat and car work predominating. Prices are being firmly maintained and range as follows for delivery in this territory:

	Parts	Carloads.	carload.
	Cents.	Cents.	
Tank, Bridge and Boat Steel.....	1.75	1.80	
Flange or Boiler Steel.....	1.85	1.95	
Commercial Firebox.....	1.95	2.00	
Marine.....	2.15	2.20	
Locomotive Firebox Steel.....	2.25	2.30	
The above are base prices for 1/4-in. and heavier. The following extras apply:			
3-16-in. thick.....		100 lb.	\$0.10
Nos. 7 and 8, B. W. G.....			.15
No. 9, B. W. G.....			.25
Plates over 100 to 110 in.....			.05
Plates over 110 to 115 in.....			.10
Plates over 115 to 120 in.....			.15
Plates over 120 to 125 in.....			.25
Plates over 125 to 130 in.....			.50
Plates over 130 in.....			1.00

Steel Billets.—The demand continues light and business drags. Such orders as have been booked are small and for prompt delivery. There is still nothing in the way of large orders before the trade, and the outlook is not particularly bright. Prices are unchanged. Ordinary Rolling Billets are quoted at \$26.20, and Forging Billets \$28.20, for delivery in this territory, subject to the usual extras for high carbons and special sizes.

Structural Material.—A fairly regular volume of business continues to come out, but large transactions develop slowly. A few good orders for special Shapes have been taken by some Eastern mills, one for 9000 tons of Beams for car work, from a Western concern, being reported. Several good building propositions are under consideration,

but no large contracts for this class of work have been placed. Prices are firm, ranging from 1.75c. to 1.90c., according to specification, for delivery in this territory.

Sheets.—A fairly good demand is reported, and the local mills have been able to continue operating at full capacity. Buyers show a disposition to anticipate their needs, but the bulk of the business placed continues to be for prompt shipment. Quotations are unchanged, and range as follows, for mill shipments, a tenth extra being added for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The orders coming out are not large, and no improvement in the volume of business offered is to be noted. Prices are a shade stronger, due largely to the firm price of Pig Iron and the advancing quotations on Old Material. Quotations for Refined Iron Bars, for delivery in this territory, range from 1.45c. to 1.55c., according to grade and tonnage. Steel Bars continue dull, at 1.55c., with Rerolled Bars at 1.50c., delivered.

Coke.—There has been a somewhat better demand for Foundry Coke, but no orders of any size have been closed. Prices appear to be a shade firmer. Furnace Coke has been rather quiet. Quotations are unchanged, but there is considerably less low price Coke around. Foundry Coke is quoted for prompt shipment at \$2.15 to \$2.25, at oven and \$2.25 to \$2.50 for forward delivery. Prompt Furnace Coke is quoted at \$1.50 to \$1.65, at oven, and \$1.65 to \$1.90 for forward delivery. For delivery in this territory during the next two months the following range of prices is named:

Connellsville Furnace Coke.....	\$3.65 to \$3.90
Foundry Coke.....	4.15 to 4.40
Mountain Furnace Coke.....	3.25 to 3.50
Foundry Coke.....	3.75 to 4.00

Old Material.—While there has not been much business transacted, the market has a decidedly stronger appearance, and sellers of some grades have advanced asking prices 25c. a ton. This is particularly the case in Heavy Melting Steel, consumers of which still refuse to pay the prices asked, but sales among dealers have been made at a higher level. Sales have been rather small throughout, and sellers show no disposition to dispose of any heavy quantities even at to-day's prices. Quotations, which are largely nominal, range about as follows for prompt shipment in buyers' yards, eastern Pennsylvania and adjoining territory:

No. 1 Steel Scrap and Crops.....	\$15.50 to \$16.00
Low Phosphorus.....	18.50 to 19.00
Old Steel Axles.....	21.50 to 22.00
Old Iron Axles.....	23.50 to 24.00
Old Iron Rails.....	20.25 to 20.75
Old Car Wheels.....	15.00 to 15.50
Choice No. 1 R. R. Wrought.....	18.75 to 19.25
Machinery Cast.....	15.25 to 15.75
Railroad Malleable.....	14.50 to 15.00
Wrought Iron Pipe.....	14.75 to 15.25
New Bundled Sheets.....	13.50 to 14.00
No. 1 Forge Fire Scrap.....	12.00 to 12.50
No. 2 Light Iron.....	9.00 to 9.50
Wrought Turnings.....	12.75 to 13.25
Stove Plate.....	13.00 to 13.50
Cast Borings.....	11.75 to 12.25
Grate Bars.....	13.50 to 14.00

St. Louis.

ST. LOUIS, November 9, 1908.

Now that the topic which has engaged the attention of the business world, together with the uncertainty as to the outcome which attended it, has been eliminated, renewals of some important but temporarily suspended new enterprises are now under way, among which is a large office building. At present the new building operations are mainly confined to structures of medium size. The most marked feature of the present situation is that inquiry shows nearly all the interests identified with railroads have been receiving a larger number of orders than during any similar period this year. In this connection is noted a quite general inquiry for Pig Iron, notwithstanding that during the past fortnight a very large tonnage had been contracted for. The manufacturing plants of St. Louis and East St. Louis are now employing more men than at any time during the present year, and it is believed that a gradual increase will take place until nearly as large a number will be employed as in 1907.

Coke.—While numerous inquiries indicate continued interest in Coke on the part of consumers, yet the leading sales agencies for the most part report the market as ruling quiet, transactions being small. As there is probably less Coke now available than within two weeks past, sellers are disposed to expect to find that large consumers will be inclined to cover during the month. Inquiries are principally for shipment over the first quarter of 1909. With regard to some contracts, buyers continue to ask that shipment be anticipated. While sales for the week have been somewhat smaller, there is a firm feeling, especially on Furnace grades, the price of which is expected to advance. We quote the market as follows: Standard 72-hr. Foundry, \$2.25 to \$2.50, and Furnace Coke, \$2 to \$2.25, both at oven, Connellsville. At the close we hear of the sale of 2000 tons of Connellsville

Foundry, shipment over first half 1909, and also of 25 carloads, same quality and shipment.

Pig Iron.—There has been an active market for Pig Iron the past week, and in the aggregate there has been quite a considerable tonnage contracted for. Leading sales agencies also report being in receipt of numerous inquiries for Southern Foundry, Malleable Bessemer and Basic. These inquiries comprise one for 4000 tons, another for 3000 tons, two for 1500 tons, three for 1000 tons, and including smaller lots total nearly 15,000 tons. Most of this Iron is wanted for shipment over the first quarter of 1909, the balance for the first half. Among the sales reported a quite large tonnage was booked for quick shipment, and for this shipment offers of \$12.50, Birmingham, for No. 2 Foundry are understood to have been accepted. It is believed, however, that there is now no more standard quality Iron to be had at this price. Traveling men state that stocks are low in Foundry yards, and the leading sales agencies report Southern furnaces holding firm at \$13, Birmingham, and not disposed to make offerings of shipment over second quarter. Some Ohio companies have advanced the price of Malleable Bessemer, and are now holding No. 2 Foundry at \$15 to \$15.25, at Ironton, shipment over first half of 1909.

Finished Iron and Steel.—The leading interests report there is at present more Structural Material being shipped to the Southwest, referring to new buildings, than is being contracted for at St. Louis, among which is 1000 tons for San Antonio. The new Merchants' Hotel at Alton, Ill., will require 250 tons. From fabricators there is a steady demand for small lots. The leading interest reports the inquiry for Standard Rails as better. Track material is in good demand. For Light Rails there is an increased and somewhat urgent demand coming from lumber interests. For Bars and Bar products the market has been ruling less active with regard to the demand from jobbers.

Old Material.—In consequence of an increase in the demand, there has been a slight advance in nearly all the list of Scrap Iron, particularly Foundry and Rolling Mill grades. Relaying Rails, especially heavy sections, continue scarce and in demand at somewhat higher figures. The offerings of Old Material on the part of the railroads comprise 2500 tons by the Missouri Pacific, 300 tons by the Vandalia and 300 tons by the Wabash. At the close of the week the market shows a better feeling than has been prevailing, and as consumers are buying more freely the situation presents less of the features of prices being made by dealers' transactions. We quote as follows, f.o.b. St. Louis, per gross ton:

Old Iron Rails.....	\$16.50 to \$17.00
Old Steel Rails, rerolling.....	15.50 to 16.00
Old Steel Rails, less than 3 ft.....	14.25 to 14.75
Relaying Rails, standard sections, subject to inspection.....	24.00 to 24.50
Old Car Wheels.....	15.50 to 16.00
Heavy Melting Steel Scrap.....	14.00 to 14.50
Frogs, Switches and Guards, cut apart.....	14.00 to 14.50
Mixed Steel.....	10.25 to 10.75

The following quotations are per net ton:

Iron Fish Plates.....	\$15.50 to \$16.00
Iron Car Axles.....	19.00 to 19.50
No. 1 Railroad Wrought.....	14.00 to 14.50
No. 2 Railroad Wrought.....	13.00 to 13.50
Railway Springs.....	13.00 to 13.50
Locomotive Tires, smooth.....	13.50 to 14.00
No. 1 Dealers' Forge.....	11.50 to 12.00
Mixed Borings, &c.....	6.00 to 6.50
Machine Shop Turnings.....	8.50 to 9.00
No. 1 Boilers, cut to Sheets and Rings.....	9.50 to 10.00
No. 1 Cast Scrap.....	13.00 to 13.50
Railroad Malleable.....	11.00 to 11.50
Agricultural Malleable.....	10.00 to 10.50
Pipes and Flues.....	9.50 to 10.00

Lead, Spelter, &c.—The market for Lead is higher with an improved demand. We quote 4.40c. to 4.50c. Lead Ore has advanced and is more active with sales at \$30 per 1000 lb., Joplin basis. Spelter is in good demand at 5c. asked, and some sales reported at that price. Zinc Ore is firm at \$36 per ton, Joplin basis. The demand from brass and galvanizing interests is increasing, but large transactions are checked through the strong ideas of producers who expect the market to do better.

The American Car & Foundry Company reports that it is now in receipt of several inquiries for new passenger car equipment. It is busy with car repair work, and contemplates increasing the number of employees in the near future.

The American Brake Company states that there was a marked improvement in October over the previous month for locomotive and car brake equipment. Repair orders also keep up well. During the week an order for brakes for 500 new cars was received.

The Es Mueller Mill Furnishing Company will at once erect a new shop at 1216-1224 South Eighth street to cost about \$20,000. It will be two stories high, built of brick and steel.

The Williams Patent Crusher & Pulverizer Company will erect a new plant consisting of one and three story buildings at 811-819 Montgomery street, to cost \$25,000.

The G. V. Bretch Butchers' Supply Company will erect a new factory on Twelfth street near Cass avenue, to cost, including lot, \$50,000. It will be three stories, brick and steel.

Cleveland.

CLEVELAND, OHIO, November 10, 1908.

Iron Ore.—A few small lots have been sold to furnace interests that had been waiting for the result of the election. The aggregate sold was only about 25,000 tons. One or two inquiries are pending and a little more may be sold before the end of the week. With weather conditions very favorable, shipments so far this month have been quite large for November. Unless freezing weather sets in earlier than usual at the head of the lakes, it is expected that the movement for the month will reach 3,000,000 tons, making the total movement for the season about 25,000,000 tons. Some of the merchant firms will send their boats up the lakes but once more for cargoes and will wind up their shipments by November 20, regardless of weather conditions. Others will keep their boats moving as long as possible, although the shipments after December 1 are expected to be very light. The Pittsburgh Steamship Company is dropping its barges as fast as they get down, but will continue its shipments to the end of the month. Dock piles at Lake Erie ports are crowded, and it is estimated that there is considerably more Ore there and in furnace yards than a year ago. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; Old Range Non-Bessemer, \$3.70; Mesaba Non-Bessemer, \$3.50.

Pig Iron.—The lively buying movement which started a few days before election has continued, and further sales are reported by local furnace interests and sales agents aggregating between 50,000 and 60,000 tons. The great bulk of this was Foundry Iron, there being a small proportion of Malleable and Basic. The buyers were for the most part consumers in northern Ohio, Michigan and Indiana, consumers in the latter States having bought considerable for shipment from Toledo. A local interest also reports sales, mostly to Eastern consumers, of 8000 tons from its Pennsylvania and New York furnaces. The tonnage sold was mostly for first half delivery, although a portion of it was for the first quarter and some for the balance of the year and extending through the first quarter. The greatest interest of the week centered in the inquiry of the Masillon Iron & Steel Company for 27,000 tons of Nos. 2, 3 and 4 Foundry Iron for delivery through the first half, that company having announced that it would make the purchase of that tonnage if the election went right. Owing to the sudden firmness of the market, due to the buying movement and the result of the election, the company bought only a part of what it inquired for, and, as far as can be learned, none of it was taken by local interests. The manager of the company says he did not buy all the tonnage he intended to for the reason that the market ran away too fast, and he cannot tell when he will buy the balance. The market is very firm and the majority of furnace interests have advanced their price 50 cents a ton. It is reported that some Iron for the first half was sold last week at \$14.75 for No. 2. The greater part of what was sold during the week went on the basis of \$15, Valley furnace, for No. 2, but since then prices have stiffened and some has been sold on the basis of \$15.25 to \$15.50, and local furnaces now refuse to quote below this for delivery after the first of the year. We quote No. 2 Foundry Iron at \$15, Valley furnace, for the first quarter, and \$15 to \$15.50 for the first half. While some inquiries are still coming in it is believed that the heavy buying movement in this territory is about over for the present. There are still good inquiries coming from the East, including one for 7500 tons of Foundry Iron. Inquiries pending in this territory are for 5000 tons of Basic, 2000 tons of Malleable, 1000 tons of Gray Forge and 1500 and 1200 tons of Foundry, as well as smaller lots of Foundry. A local Basic interest reports a good volume of inquiries, but is refusing to quote prices at present. In Southern Iron we note the sale of 1000 tons of No. 2 Soft at \$13, Birmingham, to a northern Ohio foundry for first half delivery and 500 tons of No. 2 Southern to a Cleveland consumer at \$12.50, Birmingham, the lower price for the latter being because of an option secured before the recent firmness of the market. For the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer	\$16.40
Northern Foundry, No. 1.....	\$16.00 to 16.50
Northern Foundry, No. 2.....	15.50 to 16.00
Northern Foundry, No. 3.....	15.00 to 15.50
Gray Forge.....	14.25 to 14.75
Southern Foundry, No. 2.....	17.35
Jackson County Silvery, 8 per cent. Silicon.....	20.05

Coke.—The market has been slightly more active. Furnace Coke for spot shipment is not so plentiful as it has been and its price is somewhat firmer. One furnace interest has contracted for its first half requirements. We quote Standard Connellsville Furnace Coke at \$1.90 to \$2, at

oven, for first half delivery, and 72-hr. Foundry Coke at \$2.30 to \$2.40 for the first half and \$2.25 for spot shipment.

Finished Iron and Steel.—While the feeling is decidedly better, the demand in Finished lines has not as yet shown much improvement. Some of the mill agencies report a slight increase in specifications on contracts for Steel Bars, Billets and Structural Material. Some fairly good orders that had been held up until after election have come in, and mills have the promise of some good sized orders on contract from jobbers and others for stock. We note the closing of new contracts for 1000 and 500 tons of Structural Material and Plates by Structural shops and 300 tons of Steel Bars. An inquiry is pending for 2000 tons of Steel specialties that come under the classification of Bar products, and for 500 tons of Billets and for 800 tons of Axle Billets. The demand for Iron Bars is still light, but prices are being firmly maintained, and mills are refusing to sell at present prices for extended delivery. The demand for Plates shows no improvement, and prices are still being shaded \$1 to \$2 a ton. One local Plate mill is quite busy at present, getting out its product for lake shipment before the close of navigation. The American Shipbuilding Company has taken a contract for another lake freight boat for delivery next spring, the names of the owners not being announced, and is figuring on contracts for building other boats, so that the outlook for this industry during the winter shows considerable improvement. Orders for Structural Material are coming, mostly from Structural shops that have small work on hand. Some fairly good sized Structural work is in prospect, but will probably not develop before spring. Rivet manufacturers report the taking of some large orders since election. Manufacturers are expected to order in small lots for their immediate needs during the balance of the year. Jobbers report no increased activity in warehouse business. We quote Iron Bars, 1.45c., Cleveland, for car lots; Steel Bars, 1.50c., Cleveland, for car lots, half extras; Beams and Channels, 1.70c., Cleveland, and Plates, 1/4-in. and heavier, 1.70c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Iron and Steel Bars out of stock at 1.65c. to 1.70c. Beams and Channels from warehouse are 2c., and Plates, 1/4-in. and heavier, 1.90c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.80c. Warehouse prices on Boiler Tubes, 2 1/4 to 5 in., are 65 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 71 per cent. discount.

Old Material.—The market, which has been firm for some time, has taken on a still stronger tone since election, and is a little more active. Buyers and sellers, however, cannot get together on prices. Dealers want higher prices and consumers are unwilling to pay an advance. Both producers and yard dealers, who have large stocks on hand, refuse to sell except at higher prices. There is little local demand for Scrap, but there is an improvement in inquiries from Pittsburgh and vicinity for Heavy Melting Steel, Turnings and Borings. The Baltimore & Ohio Railroad closed this week for a list of 4000 to 5000 tons, and the Norfolk & Western will close next week for about 1200 tons. While quotations below are unchanged, except in the case of Heavy Melting Steel, these prices in the main are those which consumers are willing to pay, and lower than dealers are willing to sell at. We quote as follows, per gross ton, f.o.b. Cleveland:

Old Steel Rails.....	\$14.00 to \$14.50
Old Iron Rails.....	17.00 to 17.50
Steel Car Axles.....	19.00 to 19.50
Old Car Wheels.....	14.50 to 15.00
Heavy Melting Steel.....	14.25 to 14.75
Relaying Rails, 50 lb. and over.....	22.00 to 23.00
Railroad Malleable.....	13.25 to 13.75
Agricultural Malleable.....	12.00 to 12.50
Light Bundled Sheet Scrap.....	9.50 to 10.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$20.00 to \$20.50
Cast Borings.....	7.00 to 7.50
Iron and Steel Turnings and Drillings.....	8.00 to 8.50
Steel Axle Turnings.....	8.50 to 9.00
No. 1 Busheling.....	12.00 to 12.50
No. 1 Railroad Wrought.....	13.50 to 14.00
No. 1 Cast.....	12.00 to 13.00
Stove Plate.....	10.75 to 11.25
Bundled Tin Scrap.....	8.00 to 9.00

The 1909 Hand Book of Gasoline Automobiles.—The sixth annual "Hand Book of Gasoline Automobiles" shortly to appear promises to be most useful and necessary to the automobile industry. It is published by the Association of Licensed Automobile Manufacturers, and is the authority for the public and the trade concerning the fundamental characteristics of leading American cars. This edition will be larger and more attractive in appearance than the five previous editions, which constitute an interesting and instructive index to automobile development in that time.

Pittsburgh.

PARK BUILDING, November 11, 1908.—(By Telegraph.)

Pig Iron.—Consumers on all sides are telephoning and telegraphing to furnace sales offices for prices on large blocks of Iron for delivery in first quarter and first half of next year. Some furnacemen are refusing to quote for delivery beyond first quarter. We quote Bessemer Iron \$15.50, Valley furnace, for November and December delivery, while for first quarter \$16 is asked. There is a very active demand for Basic, and the minimum price for November and December delivery is \$14.50 to \$14.75, at Valley furnace, and it is doubtful whether much tonnage could be had at these prices. For first quarter and first half delivery furnacemen are quoting on Basic from \$15 to \$15.50, at furnace. Malleable is held at \$15.50, at furnace. Foundry Iron is in active demand, and No. 2 Foundry is held at \$15.50, Valley furnace, for prompt shipment, while as high as \$16 is asked for first half delivery. Some inquiry is noted for Gray Forge, and Northern makes are now held at \$14, at furnace, or \$14.90, Pittsburgh.

Steel.—The better feeling in and higher prices for Pig Iron, and the heavy orders placed for Plates, Structural Shapes and other forms of Finished Iron and Steel are reflected in Billets, Forging Billets, and Sheet and Tin Bars, specifications against contracts in the last week or ten days having shown a material increase. Consumers of Steel are taking out more tonnage against their contracts than they had done in a long time. Prices are very firm, but unchanged. We quote Bessemer and Open Hearth Billets, 3/4 in. and larger, up to and including 0.25 carbon, \$25; 0.26 to 0.60 carbon, \$1 extra; over 0.60 carbon, \$2 extra, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, New-castle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight, or 50c. additional, is charged. Sheet and Tin Bars in random lengths are \$27.50, f.o.b. Pittsburgh. Forging Billets take \$2 advance over Rolling Billets.

Coke.—The active demand for Pig Iron has brought about some large inquiries for Furnace Coke for shipment over first half of next year, and some contracts have already been closed. One Valley furnace interest has covered its requirements for first half of next year at about \$2 a ton, at oven. A Wheeling interest is in the market for 1000 tons of Furnace Coke a day, over first six months. Connellsville Furnace Coke, for prompt shipment, is now held at \$1.85 to \$1.90, at oven. We note a sale of 1500 tons of prompt Connellsville Furnace Coke at \$1.90, at oven.

(By Mail.)

The decisive result of the election has had the effect of releasing a very large tonnage in Pig Iron, Steel and some forms of finished Iron and Steel. A large amount of business is also pending which will be closed this month. The Pig Iron market has reversed itself from a buyer's to a seller's market, and prices on all grades have advanced in the past week from 75c. to \$1 a ton. The furnaces are decidedly stiff in their ideas as to prices, and a number of sellers absolutely refuse to quote for delivery beyond first quarter of next year. Bessemer Iron, which sold two weeks ago at less than \$14.75, Valley furnace, is now firmly held at \$15.50 to \$15.75, some sellers quoting as high as \$16. Basic Iron, which sold at \$13.85, Valley furnace, two or three weeks ago, is now held at \$14.50 to \$15, one leading seller stating that he has refused \$15 at furnace on a large tonnage of Basic for first half of the year delivery. No. 2 Foundry has advanced from 75c. to \$1 a ton, and Malleable Bessemer has gone up about the same. Northern Forge is quoted 50c. higher than a week ago.

Ferromanganese.—In sympathy with other lines, the tone of the market on Ferro is stronger, and 80 per cent. foreign Ferro is now held at \$44 to \$45, seaboard, some sellers asking as high as \$46. The freight from seaboard to Pittsburgh is \$1.90 a ton. Several large blocks are under negotiation, and are likely to be closed this week.

Ferrosilicon.—The market is firmer, and we now quote 50 per cent. at \$63.50 to \$64.50, Pittsburgh, for November and December shipment. For delivery in first quarter and first half of next year, \$65 upward is asked.

Wire Rods.—Few new orders are being booked, but large consumers who covered some time ago, including leading Chain and Wire Nail manufacturers, are specifying freely against contracts, and shipments of Rods by the mills are quite heavy. The market is firm, and we continue to quote Bessemer Rods at \$33, Chain Rods \$33, and Basic \$34, Pittsburgh.

Muck Bar.—The advance of at least 50c. a ton in prices of Northern Forge Iron is reflected in Muck Bar, which is now held at higher figures, and we quote best grades, made from all Pig Iron, at \$25.50 to \$26, Pittsburgh.

Skelp.—Inquiries are a little better. Prices are nominally as follows: Grooved Steel Skelp, 1.45c. to 1.50c.; Sheared Steel Skelp, 1.50c. to 1.60c.; Grooved Iron Skelp, 1.60c. to 1.70c., and Sheared Iron Skelp, 1.70c. to 1.75c., f.o.b. Pittsburgh.

Steel Rails.—Reports given wide publicity that the manufacturers of Steel Rails would reduce prices \$4 a ton, or from \$28 to \$24, Pittsburgh, were without foundation. On the contrary, they decided last week to maintain the present price of \$28, at mill, for Standard Sections. The Cambria Steel Company has taken an order for 500 tons of 70 lb. Rails for the Manor Valley Traction Company, for delivery at Irwin, Pa. None of the leading railroads has yet placed Rail contracts for next year's delivery, but a number of them are actively figuring on their requirements, and it is expected that some large orders will be booked before the close of this year. The Carnegie Steel Company entered orders last week for about 1500 tons of Light Rails and also received some fairly large specifications against contracts. Prices on Light Rails, rolled from Billets, which are still being shaded from \$1 to \$2 a ton for Rerolled Rails, are as follows: \$25 for 25 to 45 lb. Sections, with \$1 advance for 20 lb., \$2 advance for 16 lb., and \$3 advance for 12 lb. Standard Sections are \$28, at mill, and Angle Splice Bars, 1.65c., at mill.

Plates.—The contract for Riveted Pipe for the Brooklyn water works extension having finally been secured by the T. A. Gillespie Company, Pittsburgh, requiring about 20,000 tons, the Plates for making it will be furnished by the Carnegie Steel Company. The Pittsburgh & Lake Erie Railroad has placed a contract for 1000 80,000-lb. Steel coal cars with the American Car & Foundry Company, and the Plates and Shapes, 15,000 tons or more, will likely be furnished by the Jones & Laughlin Steel Company. The Carolina, Clinchfield & Ohio Railroad has ordered 2000 cars from the Pressed Steel Car Company, and the Plates and Shapes, 30,000 tons or more, will be rolled by the Carnegie Steel Company. These car orders, with that of the Grand Trunk for 2000 cars, noted last week, will take upward of 100,000 tons of Plates, Shapes and Axles, all of which will be furnished by Pittsburgh mills. Other large orders for Plates are pending, and it seems now that the mills will have at least a moderate amount of work for the winter months. Prices on Plates continue to be shaded, mostly on the narrow sizes, from \$1 to \$2 a ton. Regular prices on Plates are as follows: Tank Plates, $\frac{3}{4}$ in. thick, $6\frac{1}{4}$ in. up to 100 in. wide, 1.60c., base, at mill, Pittsburgh. Extras over this price are as follows:

Tank, Ship and Bridge quality, $\frac{3}{4}$ -in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base. Steel Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered $\frac{3}{4}$ -in. Plate. Steel Plates over 72 in. wide must be ordered $\frac{3}{4}$ -in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the price of 3-16-in.

Percentages as to overweight on Plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under $\frac{3}{4}$ -in. to and including 3-16-in. Plates on thin edges.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boller and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates..	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Locomotive Firebox Steel.....	.50
Shell grade of Steel is abandoned.	
For widths over 100 in. up to 110 in.....	.05
For widths over 110 in. up to 115 in.....	.10
For widths over 115 in. up to 120 in.....	.15
For widths over 120 in. up to 125 in.....	.25
For widths over 125 in. up to 130 in.....	.50
For widths over 130 in.....	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.50c., f.o.b. Pittsburgh.

Structural Material.—The Cambria Steel Company has taken orders for about 6500 tons of Plates and Structural Shapes, mostly the latter, and reports other large orders pending. The county controller of Allegheny County and the county commissioners of Washington County are advertising for bids for the erection of a bridge, taking about 4000 tons of Steel, over the Monongahela River, at Monongahela, Pa., to be opened in Pittsburgh, November 25. The Bollinger-Andrews Company has taken 500 tons of Steel for a building in Pittsburgh, and the Ritter-Conley Mfg. Company has secured a contract from the Cincinnati Southern Railway for a viaduct to be built in Cincinnati, requiring about 2500 tons. Several large contracts for bridge work and Steel buildings are being figured on, which are expected to be placed within a week or two. We quote, f.o.b. mill, Pittsburgh: I-Beams and Channels, 3 to 15 in., inclusive, 1.60c., net; I-Beams over 15 in., 1.70c., net; H-Beams over 8 in., 1.80c.; Angles, 3 to 6 in., inclusive, $\frac{3}{4}$ in. and up, 1.60c., net; Angles, over 6 in., 1.70c., net; Angles, 3 x 3 in. and up, less than $\frac{3}{4}$ in., 1.50c., base, half extras, Steel Bar card; Tees, 3 in. and up, 1.65c., net; Zees, 3 in. and up, 1.60c., net; Angles, Channels and Tees under 3 in., 1.50c., base, half extras, Steel Bar card; Deck Beams and Bulb Angles, 1.90c., net; Hand Rail Tees, 3c., net; Checkered and Corrugated Plates, 3c., net.

Iron and Steel Bars.—The demand for Steel Bars continues heavy, the Cambria Steel Company having taken a

contract for 1000 tons and other new orders nearly as large have been placed. Specifications against contracts are coming out freely, and the three leading makers of Steel Bars are now operating to more than 75 per cent. of capacity. If the present rate of new orders and specifications is maintained, these concerns expect to be operating to 90 per cent. or more of capacity before the year is out. Some orders are being placed for Iron Bars and specifications against contracts are fair. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

Railroad Spikes.—More inquiry for Spikes is being received from the railroads than for some time, and in the past week or 10 days 5000 kegs or more have been placed. The demand for the smaller sizes is active, and the mills are filled up for some time. Prices are firm, and we quote: Standard sizes, $4\frac{1}{2}$ x 9-16 in., at \$1.70, and the smaller sizes at \$1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Merchant Steel.—General conditions in this trade are fairly satisfactory. While new orders are small, aside from Steel Bars, specifications are coming in well. The mills are making pretty heavy shipments of Shafting, consumers specifying quite freely against contracts placed some time ago. On large contracts for Shafting regular discounts are still being shaded. Regular prices on Cold Rolled Shafting are 57 per cent. off in carloads and 52 per cent. on less than carloads, delivered in base territory. Prices on Merchant Steel are being shaded, regular quotations being as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 1.90c. to 1.95c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher prices being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron finish, $1\frac{1}{2}$ x $\frac{1}{2}$ in. and heavier, 1.40c.; under $1\frac{1}{2}$ in., 1.55c. Planished Tire Steel is 1.60c., all f.o.b., at mill.

Spelter.—The market has again shown a sharp advance and inquiries are better than for some time. We quote prime grades of Western Spelter at 4.75c. to 4.80c., East St. Louis, equal to 4.87 $\frac{1}{2}$ c. and 4.92 $\frac{1}{2}$ c., Pittsburgh.

Sheets.—A slightly better inquiry is reported in the past week, but as yet the Sheet trade, from the standpoint of new orders, is in unsatisfactory condition. It was expected that soon after the election a good many orders that were being held up would materialize, but only a part of these has come out. The demand for Electrical Sheets is active, one or two mills that make a specialty of this product being filled up for the next two or three months. Prices on Sheets are firmer, but occasionally a desirable order is being shaded about \$1 a ton. For shipment from mill, regular prices, are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets, Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.; No. 30, 3.95c.; No. 28, Painted Roofing Sheets, \$1.75 per square, and Galvanized Roofing Sheets, No. 28, \$3.10 per square, for 2 $\frac{1}{2}$ -in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—Inquiries have been decidedly better, and additional orders from the salmon packing interests in the West have been placed. The orders from these consumers now on the books of the leading Tin Plate mills aggregate a considerable tonnage. Two or three fairly large contracts of this kind are unclosed and will probably be given to the mills within the next week or 10 days. All of these orders are for delivery prior to March 1 and will help to keep the Tin Plate mills occupied during the winter months. At present the American Sheet & Tin Plate Company is operating slightly less than 50 per cent. of its Tin Plate capacity, and the larger outside mills are running at about the same rate. Concessions in prices on both Bright and Roofing Plate are said to have entirely disappeared, and the market is firm. We now quote full regular prices on Tin Plate, as follows: \$3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—The Clark Steel Hoop Company, which is building a Hoop mill at Punxsutawney, Pa., is soliciting orders from the trade and is said to have booked a good deal of tonnage for delivery next year. The general demand continues quiet, but consumers are specifying steadily against contracts. Regular prices are reported as being maintained, as follows: Steel Hoops, 1.80c., base, full Hoop

card prices; Steel Bands, 1.40c., base, half Steel card extra, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Merchant Pipe.—The general demand continue quite active. The mills are entering more new orders than at any time this year, while specifications against contracts continue to come in quite freely. It is estimated that close to 75 per cent. of the Pipe capacity is active at present. No orders for large gas or oil lines are being placed, but some small inquiries are in the market for Casing and Line Pipe, which aggregate a fair tonnage. The mills are firmly holding prices on both Iron and Steel Pipe, but occasionally jobbers shade prices to some extent. Discounts on Steel Pipe, $\frac{3}{4}$ to 6 in., to the large trade, are 76 and 5 per cent. off list. Regular discounts are as follows:

	Jobbers, carloads, Steel.	
	Black.	Galv.
$\frac{1}{8}$ to $\frac{1}{4}$ in.....	67	51
$\frac{3}{8}$ in.....	69	55
$\frac{1}{2}$ in.....	71	59
$\frac{3}{4}$ to 6 in.....	75	65
7 to 12 in.....	72	57
Extra strong, plain ends:		
$\frac{1}{8}$ to $\frac{1}{4}$ in.....	60	48
$\frac{3}{8}$ to 4 in.....	67	55
$\frac{1}{2}$ to 8 in.....	63	51
Double extra strong, plain ends:		
$\frac{1}{8}$ to 8 in.....	56	45

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
$\frac{1}{8}$ to $\frac{1}{4}$ in.....	65	53
$\frac{3}{8}$ in.....	67	57
$\frac{1}{2}$ in.....	69	57
$\frac{3}{4}$ to 6 in.....	73	63
7 to 12 in.....	70	55
Extra strong, plain ends:		
$\frac{1}{8}$ to $\frac{3}{8}$ in.....	58	46
$\frac{1}{2}$ to 4 in.....	65	53
$\frac{3}{4}$ to 8 in.....	61	49
Double extra strong, plain ends:		
$\frac{1}{8}$ to 8 in.....	54	43

Boiler Tubes.—Railroads are buying Locomotive Tubes a little more freely, but orders are mostly for repair work. The demand for Merchant Tubes is only fair. In fact, the Tube market is about the quietest of the whole list, and has been for some time. For Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, discounts are as follows:

	Boiler Tubes.	
	Iron.	Steel.
1 to $1\frac{1}{2}$ in.....	42	47
$1\frac{1}{2}$ to $2\frac{1}{4}$ in.....	42	59
$2\frac{1}{4}$ in.....	47	61
$2\frac{1}{2}$ to 5 in.....	52	65
6 to 13 in.....	42	59
$2\frac{1}{2}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.		
$2\frac{1}{2}$ in. and larger, over 22 ft. long, 10 per cent. net extra.		

Iron and Steel Scrap.—A sharp advance has occurred in nearly all lines of Scrap. While the demand from consumers is not specially active, the supply of available Scrap seems to be limited. Dealers are firm and are not inclined to sell except at good figures. On the Pennsylvania Railroad list, to be opened this week, it is expected that bids will show the highest prices offered for Scrap by dealers in some months. The list of the Pennsylvania Lines West was opened last week, and Heavy Steel Scrap brought as high as \$16, for Pittsburgh and Sharon delivery. Prices on Heavy Steel Scrap, Borings and Turnings are considerably higher, but Cast Scrap and Low Phosphorus continue dull and prices are weak. Dealers quote about as follows: Heavy Steel Scrap, \$16 to \$16.25; Cast Iron Borings, \$10.50 to \$10.75; Bundled Sheet Scrap, \$12.50 to \$13; No. 1 Bushing Scrap, \$14.25 to \$14.50; No. 2, \$10.75 to \$11; No. 1 Railroad Wrought Scrap, \$16.75 to \$17; No. 1 Cast, \$14.50 to \$14.75; Iron Axles, \$22.50 to \$23; Sheet Bar Crop Ends, \$19.50 to \$20; Low Phosphorus Melting Stock, \$18.25 to \$18.50; Re-rolling Rails, \$17.50 to \$17.75, delivered at Cambridge, Ohio, or Cumberland, Md.; Steel Axles, \$19.50 to \$20; Grate Bars, \$12.50 to \$12.75; Old Car Wheels, \$16 to \$16.25; Machine Shop Turnings, \$11 to \$11.25; Railroad Malleable Scrap, \$14.75 to \$15; Iron Rails, \$18.75 to \$19; Locomotive Tires, \$17.25 to \$17.50. All above quotations are per gross ton, f.o.b., Pittsburgh, unless otherwise noted. We note a sale of 500 tons of Heavy Steel Scrap at \$16.25 and 250 tons of Cast Iron Borings at \$10.50, delivered Pittsburgh.

Coke.—In sympathy with Pig Iron, the situation in Coke is showing betterment, and higher prices on prompt Coke, and for delivery in first half of the year are being asked by the Coke producers. Strictly Connellsville Furnace Coke, for prompt shipment, is now held at \$1.70 to \$1.75, and for delivery over first half of the year \$1.90 to \$2 per net ton, at oven is being quoted. At present, furnaces are not disposed to pay these higher prices for Coke, and are holding off placing their contracts. Connellsville 72-hour Foundry Coke is also higher, and is held at \$2.15 to \$2.25 a ton, at oven, for prompt shipment. For delivery over first half of the year from \$2.25 to \$2.50, at oven, is quoted. The Coke output is increasing, about 55 per cent. of the

ovens in the Upper and Lower Connellsville regions now being in blast.

Cincinnati.

CINCINNATI, OHIO, November 11, 1908.—(By Telegraph.)

It has been a week of increasing wakefulness on the part of all factors in every branch of the Iron and Steel trade, and the markets are all relatively stronger. The Pig Iron market is enjoying the first substantial effects of election confidence, and all agencies are busied with inquiries, some coming from the extreme West. In the immediate Central West there have been several more or less successful efforts to buy on speculation, but practically all inquiries in hand are for requirements covering the first quarter and half of next year. Shops in which repairs are made on car equipment are rushed with orders, which is shown in orders for Malleable and Foundry Irons for immediate delivery. Machine tool manufacturers have not yet felt any special effects of the improved tone, but are confident. Scrap dealers are holding firm on quotations, and are confident that the new year will usher in a big buying movement. The largest Pipe interest is credited with having made some specially good purchases of Iron for delivery in November and December at \$12.50, Birmingham, for November.

Pig Iron.—The market is very active. All agencies are busied with inquiries for first half and quarter requirements. Notices of withdrawal from the market on deliveries covering balance of the year have been received by agents of several furnaces in both the Birmingham and Iron-ton districts. One large interest restricts its agents to 100-ton orders at the prevailing minimum market of \$15.25, Iron-ton, and announces with emphasis that there is nothing obtainable at less than \$13, Birmingham, on Southern Foundry grades, these rates covering deliveries over balance of the year. For next year nothing better than \$13, Birmingham, for No. 2 is heard. A sale of 10,000 tons of Southern Foundry to an Indiana speculator at \$12.50, Birmingham, balance of the year, is a discussed feature of the week. A Chicago electrical interest is understood to be negotiating a 5000-ton deal on speculation. Most of the inquiries noted last week are still pending, save that the car manufacturing interest which wanted Northern Foundry and Forge for the first quarter is understood to have secured the Forge. A large Tennessee manufacturing interest is reported to have bought 1000 tons of Forge at about \$11, Birmingham, through special connections and influences. There appears to be a strong buying movement indicated in Malleable and Basic from inquiries at hand, and it is difficult to secure reliable quotations on either, as almost all offers are being put up to the furnaces for consideration. Ohio 8 per cent. Silicon Silveries are still quotable at \$18.50, at furnace. Red River producers are maintaining the same basis of computation, notwithstanding reports of underselling. Among the heavy inquiries in this market to-day are to be noted those of the northern Indiana agricultural implement manufacturer, who wants 2000 tons low grade, sulphur under 0.07 and silicon 0.75 to 1.50, low phosphorus and high manganese, deliveries January to April, inclusive; an Indiana manufacturer, 2000 tons of Malleable for the first half; a northern Ohio melter, 1000 tons of Malleable for the second quarter; an Illinois engineering concern, 500 tons of No. 2 Alabama Foundry, for the first half; a large Illinois machine company, 500 tons of No. 2 Soft for the first half; another Illinois concern, 500 tons of Nos. 2 and 3 Foundry for the first half; a Chicago stove manufacturer, 500 tons of No. 2 Foundry for the second quarter; a Wisconsin manufacturer of bridges, 100 tons each of No. 1 Soft and No. 2 Foundry for the first half; a mining concern in the West, 500 tons of No. 1 Soft and 150 tons of 10 per cent. Silicon for early delivery, and a local Steel making concern, 3000 to 5000 tons of Basic for December, January, February and March and same amount for second quarter. The new freight rates on Iron from the Iron-ton and Columbus districts, ranging from 5c. to 15c. under last quoted rates, are now effective throughout the State and into nearby territory. For immediate delivery and for balance of the year we quote, based on freight rates of \$3.25 from Birmingham and \$1.10 from the Hanging Rock District, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$16.25 to \$16.75
Southern Coke, No. 2.....	15.75 to 16.25
Southern Coke, No. 3.....	15.25 to 15.75
Southern Coke, No. 4.....	15.00 to 15.50
Southern Coke, No. 1 Soft.....	16.25 to 16.75
Southern Coke, No. 2 Soft.....	15.75 to 16.25
Southern Coke, Gray Forge.....	14.25 to 14.75
Ohio Silvery, 8 per cent. Silicon.....	19.70
Lake Superior Coke, No. 1.....	16.85 to 17.35
Lake Superior Coke, No. 2.....	16.35 to 16.85
Lake Superior Coke, No. 3.....	15.85 to 16.35
Standard Southern Car Wheel.....	22.25 to 22.75
Lake Superior Car Wheel.....	21.75 to 22.25

(By Mail.)

Coke.—Dealers report that with some prices are a little stiffer, and furnaces are inclined to hurry shipments on contract. Pocahontas Furnace Coke is quotable at \$1.85 to \$1.90, at oven; Wise County, \$2; Connellsville, \$2 to \$2.25,

all for first half delivery. Some Virginia Furnace Coke is obtainable for this delivery as low as \$1.85. There is no appreciable increase in inquiry or sale for Foundry grades which are quotable: Pocahontas, \$2 to \$2.10, at oven; Wise County, \$2.25; Connellsville, \$2.35 to \$2.50. Effects of the long continued drought are showing with the smaller producers.

Finished Iron and Steel.—With the dealers there is a much better feeling apparent, although not yet strong enough to produce business. Most mills in this territory are running better than 50 per cent. The plant of the Andrews Steel Company, Newport, is operating ten mills on full time, beginning two weeks ago. The expectation is that this will be continued the balance of the year. Rumors are current here that the largest interest has advanced Iron Bars, but dealers have as yet no such notification. All factors in the finished trade are having a better line of inquiries, but admit that it is a little early to expect any marked change. Architects having in charge the building of the \$500,000 Emery Memorial, for the Ohio Mechanics' Institute, are preparing drawings, and will have specifications ready for bids late in January or early in February. Little finished material, aside from twisted Steel Bars and some trusses, will be used in this structure, which is to be of reinforced concrete. Dealers are quoting to the trade, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.55c., base, with half extras; small lots from store, 1.85c., base, half extras; Steel Plates, carload lots, 1.75c., base, with half extras; small lots from store, 1.85c., base, half extras; Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c.; Beams, Channels, and Structural Angles, 1.85c., base; small lots from store 2.10c.; Plates, 1/4-in. and heavier, carload lots, 1.85c.; small lots from store, 2c.; Blue Annealed Sheets, heavy, No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store 2.20c.; No. 12, carload lots, 2c.; small lots from store, 2.30c.; Sheets (Light), Black, No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c.; Steel Tire, 4-in. and heavier, carload lots, 1.95c.; Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—Following the lead of Pig Iron, there is a little stiffening in price of Scrap in this market. The majority of the largest dealers have increased prices from 25 to 50 cents a ton on the more staple items. Dealers for the most part announce that present prices will not rule long, and are freely predicting higher quotations before the close of the month. There is no confirmed improvement, save a trifle better inquiry, in any line of Scrap. We quote asking prices to the trade as follows, f.o.b. Cincinnati:

No. 1 R. R. Wrought, net ton.....	\$12.75 to \$13.75
Cast Borings, net ton.....	5.25 to 5.75
Heavy Melting Steel Scrap, gross ton..	13.50 to 14.50
Steel Turnings, net ton.....	6.00 to 7.00
No. 1 Cast Scrap, net ton.....	12.00 to 13.00
Burnt Cast, net ton.....	9.00 to 10.00
Old Iron Axles, net ton.....	16.75 to 17.75
Old Iron Rails, gross ton.....	15.00 to 16.00
Old Steel Rails, short, gross ton.....	13.00 to 14.00
Old Steel Rails, long, gross ton.....	12.75 to 13.75
Relaying Rails, 56 lb. and up, gross ton	20.50 to 21.50
Old Car Wheels, gross ton.....	13.00 to 14.00
Low Phosphorus Scrap, gross ton.....	14.00 to 15.00

Birmingham.

BIRMINGHAM, ALA., November 9, 1908.

Pig Iron.—The aggregate of engagements for the week just ended is placed at 50,000 to 75,000 tons. The demand has come from practically all lines of foundry trades, and a number of transactions recorded involve deliveries covering the entire first half of 1909. It is probable that in one or more round tonnage considerations early in the week the schedule of \$13, Birmingham, was slightly shaded, but with indications favorable for a general buying movement, quotations have stiffened, with a tendency to advance. The present second largest producer has adopted a basis of \$13.50, Birmingham, for quotations, but such figures are considered prohibitive. A lot of 500 tons of 2.25 to 2.75 per cent. Silicon Iron recently sold at \$13.75, Birmingham. There has been a decided improvement in the demand for Charcoal Iron. The latest sale reported was 2500 tons of chilling grades, which brought \$20, at furnace. The probable make of this grade for some months has been disposed of, but there is an accumulation of soft grades which are quoted at \$19.50, at furnace. Of all recent engagements, the proportion of early shipments that has been specified is such that the tonnage to be carried over by producers has been materially increased, notwithstanding the proposed increase in the output. There is some speculation, however, as to the probable additions to first quarter commitments. The number of inquiries pending are indicative of a considerable tonnage yet to be placed, but there is apparently no eagerness among prospective purchasers to cover for their requirements. The fact that requirements in a number of cases have been provided for on the hand to mouth order for some months, no doubt accounts largely for the recent activity in the market, but the trade generally seems to anticipate a

gradual improvement and is disposed to provide accordingly.

Cast Iron Pipe.—An advance in quotations on this commodity is not authorized, but the market is more active, with probably less shading, in order to effect the sale of round tonnages than at any time for some months past. The principal contract placed with Southern producers recently covers approximately 3000 tons of Water Pipe for the city of Los Angeles, Cal. This was awarded to the American Cast Iron Pipe Company, Birmingham, Ala., which concern was also the successful bidder on 1000 tons for Springfield, Mo. A contract to cover 1250 tons of Water Pipe for Gadsden, Ala., will be placed November 12, and 1000 tons for Spokane, Wash., is for letting about November 15. The aggregate of less than 1000 tons lots in sight is attractive, and the market generally presents a more encouraging aspect. We quote as follows, for Water Pipe, f.o.b. cars here, per net ton: 4-in. to 6-in., \$24; 8-in. to 12-in., \$23; over 12-in., average, \$22, with \$1 per ton extra for Gas Pipe.

Old Material.—Recent political developments are so far without a material effect upon this market. Indications are favorable for the resumption of operations at mills now idle, and an increase in the consumption is anticipated, but a comparatively small volume of business has been transacted the past week. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$14.50 to \$15.00
Old Iron Axles.....	15.50 to 16.00
Old Steel Axles.....	13.00 to 13.50
No. 1 Railroad Wrought.....	13.50 to 14.00
No. 2 Railroad Wrought.....	10.50 to 11.00
No. 1 Country Wrought.....	11.00 to 11.50
No. 2 Country Wrought.....	9.50 to 10.00
No. 1 Machinery.....	11.00 to 11.50
No. 1 Steel.....	9.50 to 10.00
Stove Plate and Light Cast.....	9.50 to 10.00
Cast Borings.....	5.00 to 5.50

Buffalo.

BUFFALO, N. Y., November 10, 1908.

Pig Iron.—The market has shown a pronounced gain in strength, with decidedly greater activity in inquiry and a noteworthy increase in orders both for prompt and forward deliveries. There has as yet been no material change in the schedule of prices, but it is probable that the larger orders booked and the increased inquiry for future deliveries will impel the furnaces to advance same shortly. One of the largest of the local furnaces has stopped solicitation of business for prompt delivery, being booked to capacity to the end of the year, and is asking advances over the prices quoted below for forward shipments covering the first quarter and half of 1909. We quote for the current quarter, f.o.b. Buffalo:

No. 1 X Foundry.....	\$15.50 to \$16.00
No. 2 X Foundry.....	15.25 to 15.75
No. 2 Plain.....	14.75 to 15.25
No. 3 Foundry.....	14.50 to 15.00
Gray Forge.....	14.25 to 14.75
Basic.....	15.00
Malleable Bessemer.....	15.50 to 16.50
Charcoal.....	20.00 to 20.50

Old Material.—The market is notably stronger, with some dealers inclined to hold material for better prices. Consumers do not readily agree to the higher schedule asked, basing their ideas of values on the prevailing prices for Pig Iron, and in consequence no large tonnages are changing hands. Sales in some lines, however, are being made at improved prices. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy Melting Steel Scrap.....	\$14.50 to \$15.00
No. 1 Railroad Scrap.....	15.25 to 15.75
No. 1 Railroad and Machinery Cast Scrap.....	14.50 to 15.00
Old Steel Axles.....	18.00 to 18.50
Old Iron Axles.....	21.00 to 21.50
Old Car Wheels.....	15.00 to 15.50
Railroad Malleable.....	13.00 to 13.50
Boiler Plate.....	12.00 to 12.50
Locomotive Grate Bars.....	12.00 to 12.50
Pipe.....	12.00 to 12.50
Wrought Iron and Soft Steel Turnings.....	9.00 to 9.25
Clean Cast Iron Borings.....	8.00 to 8.50
No. 1 Busheling Scrap.....	13.00 to 13.50

Finished Iron and Steel.—Orders for Bars and Plates continue in about the same volume as prior to election, with some improvement in railroad material, aside from Rails, especially for new cars and repairs. Inquiry is becoming brisker, and there are a number of projects requiring Structural Steel in this district that will be proceeded with as soon as they can be financed. The George Kellogg Structural Company has been awarded the contract for the Structural Steel required for the Buffalo Seminary Building, about 200 tons.

Casey & Murray, Rochester, who hold contract for the construction of section No. 31, new State Barge Canal, have placed an order with Whitehead & Kales, Detroit, for 1000 tons of Structural Steel and Castings to be used in connection with lock and dam work on that section, and have orders still to place for twisted Steel Bars required for the same work, about 25 tons.

Metal Market.

NEW YORK, November 11, 1908.

Pig Tin.—Consumers, having bought before election, are now out of the market. Reports of the large business transacted are either exaggerated or false. Some speculative buying has been indulged in, but in a limited way. Prices are only slightly higher than a week ago. The changes during the week have been as follows:

	Cents.
November 4.....	30.35 to 30.37½
November 5.....	30.35
November 6.....	30.75
November 9.....	31.25
November 10.....	30.95
November 11.....	30.75

The London market closes to-day at £139 7s. 6d. for spot and £140 17s. 6d. for futures. The arrivals so far this month are 1365 tons, and there are afloat 1662 tons.

Copper.—A rapid advance in the price of Copper in London following the election carried prices to new high levels for the year. It has been the busiest week in the Copper trade in nearly two years. Following a higher market in London on Wednesday, last prices for spot on that exchange advanced by Monday £2 16s. 3d. and for futures £3. On Tuesday there was a slight setback, but to-day's quotations are only slightly below those of Monday at £64 11s. 3d. for spot and £65 10s. for futures. This activity in London caused selling agencies and dealers here to very quickly readjust their prices, and to-day Lake is held at 14.75c. and Electrolytic at 14.50c., cash, an advance of ¾c. per pound in a week. This seems very rapid, and undoubtedly was caused by the attempt to crowd into two weeks the accumulated business of several. It appears somewhat strange that the Electrolytic market should have followed the Lake market so closely, as Lake Copper has been in relatively better demand for the last four months. This is on account of its being used in the manufacture of Brass and Sheet Copper, which trades were more nearly normal before election than the Wire trade, where Electrolytic Copper is extensively used. Most of the consumers of Lake Copper have covered their requirements for the year, and are now buying for the first quarter of 1909. One phase of the Copper trade, particularly the Lake trade, which, although known to many is not always taken into consideration, is that stocks of finished material in the hands of manufacturers and dealers are relatively light, and in consequence when the market began to advance so rapidly orders were sent in by dealers for large supplies. This has resulted in some places in the clogging of mills, and at least one manufacturer of Sheet Copper is much behind in orders. On receipt of orders held up pending election manufacturers at once rushed into the market to buy raw material, and in so doing advanced the price on themselves. Stocks of Copper in Europe are large, and while these are in the hands of speculative consumers, banking interests and agents for American Copper selling companies, and so firmly held that they will not come out on declines, it may be well to observe that in all probability these supplies will be utilized in Europe should the market advance much further. Should these holders of Copper in Europe feed out their stocks exports would dwindle and American consumption even at prosperity's flood tide is not equal to the production. This production is steadily increasing, and electrical developments and extensions of existing enterprise and many new projects will have to be brought out before the consumption is as large as in the latter part of 1906 and in early 1907. Sheet Copper has been advanced to 19c. basis. The exports so far this month are less than 4000 tons.

Waterbury Average.—The Waterbury average for October was 13.75c.

Lead.—The market is in a somewhat peculiar position. Independent holders are quoting 4.42½c., New York, and 4.30c., St. Louis. This shows a slight easing from the latter part of last week, when 4.30c., St. Louis, was refused by some of these interests. The American Smelting & Refining Company continues to book orders for shipment Lead on a basis of 4.30c., New York. This company is reported to have made some very quick deliveries recently.

Antimony.—In common with other metals, there is more inquiry for Antimony, and this is particularly felt by importers. Prices are only slightly stronger, however, Hallett's being held at 8.12½c. to 8.25c., Cookson's 8.37½c. to 8.50c., and outside brands at 8c.

Aluminum.—A further reduction in the price of Aluminum was announced this week, and ton lots of No. 1 ingots are quoted at 25c. This is a cut of 4c. per pound, following one of like amount made early in October, making a total reduction since October 1 of 8c. per pound. Sheets are now held on a basis of 35c. Reports from Pittsburgh are to the effect that the demand for Aluminum Sheets is very large. These have an increasing use in the manufacture of automobile bodies.

Nickel.—The price of this metal is unchanged at 45c. for 10-ton lots, and 50c. to 60c. for smaller quantities.

Tin Plates.—Prices are absolutely without change at

\$3.89, New York, and \$3.70, Pittsburgh, for 100-lb. IC Coke Plates. In Swansea Welsh Tin Plates are 1½d. higher, at 12s. 3d.

Old Metals.—Business is not so active as in some of the last few weeks, but this is because holders of metal are unwilling to dispose of their stocks at present prices. Consumers are anxious to have quotations made, and some have paid high prices for quick shipments. Some dealers are making an active campaign to secure cheap metal, and in some cases they are successful. This accounts for a part of the buying. Other dealers are anxious to cover their outstanding contracts, and as they have sold short are paying long prices. Under these conditions prices correspond more to advances in Ingot or Pig Metals rather than actual transactions in Old Metals, and dealers' selling prices are quoted as follows:

	Cents.
Copper, Heavy and Crucible.....	13.75 to 14.00
Copper, Heavy and Wire.....	13.50 to 13.75
Copper, Light and Bottoms.....	12.50 to 12.75
Brass, Heavy.....	9.75 to 10.00
Brass, Light.....	7.75 to 8.00
Heavy Machine Composition.....	12.75 to 13.25
Clean Brass Turnings.....	9.00 to 9.50
Composition Turnings.....	10.50 to 11.00
Lead, Heavy.....	4.25
Lead, Tea.....	4.00
Zinc Scrap.....	3.50

New York.

NEW YORK, November 11, 1908.

Pig Iron.—There has been a very heavy movement, in which all interests have participated, both in this territory and in New England. The sales include 15,000 tons to one Pipe foundry. Some large inquiries are under negotiation. These include for 8000 to 10,000 tons for one New England foundry interest, 3000 tons for another, 8000 to 13,000 tons for two soil Pipe plants in this territory, and 6000 to 8000 tons for an agricultural implement maker. Manufacturers of railroad supplies are also calling for a round tonnage, while Southern Iron has been above parity here, yet, in the aggregate, quite a large tonnage has been recently sold in this district and in New England to founders who insist upon keeping some of it in their mixtures. We quote, at tidewater, \$17.50 to \$17.75 for No. 1 Northern Foundry, \$17 to \$17.50 for No. 2 Foundry, and \$16 to \$16.50 for No. 2 Plain. Alabama Irons are quoted at \$17.50 to \$17.75 for No. 1 Foundry, and \$17.25 to \$17.50 for No. 2 Foundry.

Steel Rails.—The Atlantic Coast Line has given an order for 25,000 tons of Bessemer Rails to the Maryland Steel Company, rollings beginning at the Sparrows Point mill in March. The South Chicago mill has sold 4000 tons for a traction line in Michigan, and the Lackawanna Steel Company has booked 2000 tons for the Anglo-Newfoundland Development Company, a Newfoundland corporation. The Burlington Road is reported in the market for 40,000 tons for 1909. There is no basis for reports as to any change in prices for 1909, and sales are made at \$28, for Bessemer, and \$30 for Open Hearth Rails. With the adoption of the new specifications, it is not expected that any large percentage of the Rail requirements for next year will be called for in Open Hearth Steel. Several roads are now canvassing the question of their needs for next year, and the placing of good sized orders is expected in the near future.

Structural Material.—Some indication is seen of an effort to bring up prices on fabricated work, and to cure the irregularity that has been apparent for some time in prices of Structural Steel. The amount of business taken at low figures insures the operation of a number of plants with increased forces for a good many weeks, and it is believed there is sentiment enough in favor of a better basis to make itself felt in the market. The principal local contract in the past week was the New York Central suburban station and street crossing work, 4700 tons, which went to the Lackawanna Steel Company. The new subway work at Ninety-sixth street, 1800 tons, was awarded to Terry & Tench. The Levering & Garrigues Company has the contract for the Martinique Hotel addition, 1500 tons, and the Steel will be furnished by the Lackawanna Steel Company. The latter company also furnishes the Steel for the new Hotel Blackstone, at Chicago, 5300 tons, for which the Brown-Ketcham Iron Works, Indianapolis, Ind., has the fabricating contract. The Brown-Ketcham Iron Works also has the Public Library Building, 2000 tons, and the Post Office, 1350 tons, at St. Louis, and an office building at San Antonio, Texas, 500 tons. The William Penn High School, Philadelphia, 1200 tons, goes to the Phoenix Bridge Works, and a Y. M. C. A. Building, at Pittsburgh, 850 tons, to the Jones & Laughlin Steel Company. Bids have gone in on the Twentieth Street Viaduct, at Denver, Colo., 3000 tons, to be built by four railroads; also on the Detroit-Edison Company's addition to its power house, at Delray, below Detroit, 1500 tons. Manufacturers who use the lighter Structural Shapes are inquiring for material for next year, as far ahead as July 1. Dealers have not yet bought beyond January 1,

and dealers' orders for the first quarter will not be entered much before December 1. On mill shipments, tidewater deliveries, we quote as follows: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles, over 6 in., the extra is 0.10c. Structural Material, cut to lengths, is sold in small lots at about 2¼c.

Ferroalloys.—This market is quiet. Sales of 50 per cent. Ferrosilicon have been made, at \$68, delivered. Ferromanganese is firm, and there is talk of an advance in the near future from \$43, Baltimore, to \$45.

Bars.—A decidedly better feeling is noted in the Bar Iron market, orders having been placed quite freely during the entire week. Inquiries are numerous, with some consumers disposed to make contracts for their requirements for six months at a shade under ruling prices. Bar Iron manufacturers, however, are firmer in their views, being undoubtedly influenced by the hardening of prices of raw material. While these manufacturers are not now organized, the smaller makers are closely observing the attitude of the leading companies, and are expected to closely follow if the latter advance their prices. While the market is more closely approaching 1.50c., tidewater, as the ruling price, it is still possible to secure some Bar Iron at 1.45c., tidewater. Steel Bars continue to be held at 1.56c., tidewater.

Plates.—Last Friday the judicial decision was rendered in the case of the contract for Riveted Pipe for the extension of the Brooklyn Water Works, and the injunction was dissolved with the result that the contract has been awarded to the T. A. Gillespie Company. This insures the purchase at Pittsburgh of the 20,000 tons of Plates required for this Pipe. The general demand for Plates has been decidedly better, with numerous small orders entered and an increased volume of inquiries. Among the inquiries are some for fair quantities for export. Prices are held as follows, at tidewater, for standard sized Plates: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Firebox Plates, 2.65c. to 3.50c., according to specifications.

Cast Iron Pipe.—The Board of Water Commissioners, Amsterdam, N. Y., is having plans prepared for a high pressure line, 12½ miles long, to extend from Hanns Creek to Kellogg Reservoir, Amsterdam, to be constructed of 30-in. Cast Iron Pipe. Bids will be called for in the course of the next 60 days. The Knapp-Cramer Hardware Company, North Tonawanda, N. Y., has been awarded a contract by the local Board of Water Commissioners for 5000 ft. of 4-in., 1000 ft. of 6-in. and 1000 ft. of 12-in. Cast Iron Pipe. The company will sublet this contract. More serious attention is now being given to the proposition for a water works plant on which bids were recently opened by the city of Passaic, N. J. Indications are strong that the contract will be awarded and that the work may be undertaken by the municipality. It is understood that the lowest bidder on the Pipe for this undertaking is a Philadelphia firm. While a better tone is perceptible in the Pipe trade, the volume of business since the election has not been large. A considerable number of small orders have been placed for the Pipe needed for work to be completed this fall, but inquiries are lacking for anything like large quantities. Carload lots of 6-in. are quoted at \$24 per net ton, tidewater.

Old Material.—Prices have responded to an improved demand in all lines, and quotations are 25 to 50 cents per ton higher. While no large transactions are reported, the demand for small quantities is general, coming from all classes of consumers. The railroad lists which have been put out for this month are much larger than had been expected, but it is believed that offerings from this quarter will speedily be absorbed. Among recent transactions are sales of about 5000 tons of Old Steel Rails at about \$15.25, delivered at buyer's mill in western New York. Quotations are as follows, New York and vicinity, per gross ton:

Old Girder and T Rails for melting.....	\$11.75 to \$12.25
Heavy Melting Steel Scrap.....	11.75 to 12.25
Old Steel Rails, rerolling lengths.....	14.50 to 15.00
Relaying Rails.....	23.00 to 23.50
Old Iron Rails.....	17.50 to 18.00
Standard Hammered Iron Car Axles.....	19.00 to 19.50
Old Steel Car Axles.....	16.00 to 17.00
No. 1 Railroad Wrought.....	15.25 to 16.00
Iron Track Scrap.....	12.25 to 13.00
No. 1 Yard Wrought, long.....	14.50 to 15.00
No. 1 Yard Wrought, short.....	13.00 to 14.00
Light Iron.....	7.50 to 8.00
Cast Borings.....	8.00 to 8.50
Wrought Turnings.....	9.00 to 9.50
Wrought Pipe.....	11.50 to 12.00
Old Car Wheels.....	14.50 to 15.25
No. 1 Heavy Cast, broken up.....	13.75 to 14.25
Stove Plate.....	11.50 to 12.00
Locomotive Grate Bars.....	11.50 to 12.00
Malleable Cast.....	12.50 to 13.00

Iron and Industrial Stocks.

NEW YORK, November 11, 1908.

The security markets were greatly stimulated by the result of the election. Industrial stocks participated largely in the improved demand coming from the investing and spec-

ulating public. Among favorite stocks was United States Steel common, transactions in which constituted by far the larger part of the dealings on the New York Stock Exchange for several days in succession. It is noteworthy that on Saturday last this stock sold at 55½, which is the highest price on record, being half a dollar above the previous high price, recorded in April, 1901. Other stocks made sharp advances. The range of prices on active industrial stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 50¼ to 55½, preferred 112¼ to 113¾; Bethlehem Steel common 23 to 25¾, preferred 50¾ to 53½; Car & Foundry common 44½ to 47¾, preferred 106¼ to 108; Locomotive common 53½ to 59, preferred 108½ to 110¾; Steel Foundries, new, 32½ to 39¾; Cambria Steel 37¾ to 40¼; Colorado Fuel 37¾ to 40¾; Crucible Steel common 8 to 8½, preferred 50 to 53½; Pressed Steel common 36½ to 41, preferred 96½ to 99; Railroad Spring common 44 to 46¼, preferred 99 to 100¾; Republic common 25¾ to 28¼, preferred 83½ to 87¾; Sloss-Sheffield common 74½ to 80, preferred 107¼ to 109; Cast Iron Pipe common 26½ to 30¼, preferred 73 to 76½; Can common 7¾ to 9¾, preferred 69½ to 74½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 54¾, preferred 112½, bonds 101¾; Car & Foundry common 45¾, preferred 107; Locomotive common 56, preferred 110; Colorado Fuel 39½; Pressed Steel common 39¾, preferred 99; Railway Spring common 45; Republic common 27¼, preferred 87; Sloss-Sheffield common 78¼; Cast Iron Pipe common 29¼, preferred 76; Can common 9¼, preferred 74.

Dividends.—The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has declared a quarterly dividend of 1¼ per cent.

The Niles-Bement-Pond Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 16, and 1½ per cent. on the common stock, payable December 21.

The Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable November 16.

The Sloss-Sheffield Steel & Iron Company has declared a quarterly dividend of 1 per cent. on the common stock, payable December 1.

More Steel Passenger Cars Ordered.

In continuance of its declared policy to make future additions to its passenger equipment as nearly fireproof and collision proof as possible, the Pennsylvania Railroad Company November 6 placed orders for 77 all steel passenger cars. This is in addition to orders for 200 of these cars which have been placed already, and of which about 110 have now been received and placed in service on regular through trains. Of the newly ordered cars, 31 will be made by the Pressed Steel Car Company. To the American Car & Foundry Company is awarded a contract for 29 of the new cars. The Standard Steel Car Company will construct 17. All of these cars are to represent the latest improvements in the art. A number of minor alterations have been made in the former design with a view to increasing the comfort of the passengers. Some further progress has also been made in the elimination of wood and other inflammable material. Aside from the mahogany window sash and seat frame there is to be no wood whatever in the cars. Out of a gross weight of about 116,000 lb. for the entire car, the wood in it will weigh only about 300 lb. The new cars will have 1300 lb. of open hearth steel for every passenger carried. The feature of construction, the factor which will secure these cars against the dangers of collision, is a central box girded 24 in. wide and 19 in. deep, extending throughout the length of the coach. To further insure the car against collapsing, its frame structure is designed upon the principle of the cantilever bridge, with the trucks as piers. The floor of the car is of magnesium cement, laid on corrugated iron. The coach is lighted by electricity, derived from train generators or storage batteries. Forced ventilation will be a feature of the new equipment. Each car will be perfectly ventilated, even when all the windows are closed.

The Pittsburgh Railways Company has placed an order with the Forged Steel Wheel Company, an identified interest of the Standard Steel Car Company, for 6000 forged steel wheels for delivery next year. The plant of the Forged Steel Wheel Company is located at Butler, Pa. The steel for the wheels will be furnished by the Carnegie Steel Company.

Bids for Battleships and Armor.

WASHINGTON, D. C., November 10, 1908.—The Secretary of the Navy yesterday opened bids for the construction of the battleship Utah, for machinery for the battleship Florida, which is to be built in a Government yard, and for 9418 tons of armor for both battleships. Owing to the great variety of alternative bids submitted for the construction of the Utah, a very careful examination of the proposals will be necessary before an award is made, but the New York Shipbuilding Company's bid on the Department's plans and specifications was much the lowest. The Newport News Shipbuilding & Dry Dock Company submitted a series of bids for machinery for the Florida, but no other concern offered to supply the complete installation, although the Fore River Shipbuilding Company offered to furnish certain parts of the installation at specified prices.

The Carnegie Steel Company, Bethlehem Steel Company and Midvale Steel Company submitted identical bids for 8487 tons of the armor advertised for, and each of the three concerns made the lowest bid for one of the three small lots, making up the remainder of the quota. The fact that, although the Midvale Steel Company but recently entered the armor plate field as a sharp competitor of the Carnegie and Bethlehem concerns, the three companies to-day submitted practically identical bids occasioned considerable comment among officials of the Department, but as the proposals are all regarded as fairly reasonable it is assumed that the contract will be divided somewhat in accordance with the facilities of the respective competitors and their outstanding engagements.

Following is a summary of the various bids:

Battleship Utah.

Class 1.—Hull and turbine machinery, plans and specifications provided by the Secretary of the Navy.

Class 2.—Hull and reciprocating machinery, plans and specifications provided by the Secretary of the Navy.

Class 3.—Hull and equipment, plans and specifications provided by the Secretary of the Navy; machinery, bidder's plans and specifications.

William Cramp & Sons Ship & Engine Building Company.—Class 1, ship of 20% knots, delivered 35 months, \$4,330,000; class 2, ship of 20% knots, delivered 35 months, \$4,270,000; class 3, ship of 21 knots, delivered 36 months, with Cramp-Zoley turbines, \$4,450,000.

Fore River Shipbuilding Company.—Class 1, no bid; class 2, no bid; class 3 (a), ship of 20% knots, 32 months, Curtis turbines, \$4,463,000; (b) ship of 21 knots, 32 months, with Curtis turbines, \$4,510,000; (c) ship of 20% knots, 32 months, with Curtis turbines, \$4,472,000; (d) ship of 21 knots, 32 months, with Curtis turbines, \$4,519,000; (e) ship of 20% knots, 32 months, with Curtis turbines, \$4,393,000; (f) ship of 21 knots, 32 months, with Curtis turbines, \$4,440,000; (g) ship of 20% knots, 32 months, with Curtis turbines, \$4,413,000; (h) ship of 21 knots, 32 months, with Curtis turbines, \$4,460,000.

Newport News Shipbuilding & Dry Dock Company.—Class 1, ship of 20% knots, 32 months, \$4,180,000; class 2, ship of 20% knots, 32 months, \$4,150,000; class 3 (a), ship of 20% knots, 32 months, with Parsons turbines, \$4,100,000; (b) ship of 20% knots, 32 months, with reciprocating engines, \$4,070,000.

New York Shipbuilding Company.—Class 1, ship of 20% knots, 32 months, \$3,946,000; class 2, no bid; class 3, no bid.

Machinery for Battleship Florida.

Class 4.—In accordance with plans and specifications provided by the Secretary of the Navy.

Class 5.—In accordance with bidder's plans and specifications.

Newport News Shipbuilding & Dry Dock Company.—Class 4, machinery guaranteeing 20% knots, \$1,715,000; class 5 (a), machinery, including Parsons turbines, guaranteeing 20% knots, \$1,517,000; (b) machinery, including reciprocating engines, guaranteeing 20% knots, \$1,588,000; (c) machinery, including reciprocating engines, guaranteeing 20% knots, \$1,542,000.

Fore River Shipbuilding Company.—Informal proposition to supply certain items of machinery at various prices.

Armor.

Class A, 8487 tons; class B, 467 tons; class C, 390 tons; class D, 74 tons.

Carnegie Steel Company.—Class A, \$420; class B, \$415; class C, \$455; class D, \$600; deliveries to begin in six months and proceed at rate of 600 tons per month.

Bethlehem Steel Company.—Class A, \$420; class B, \$408; class C, \$390; class D, \$74; deliveries to begin in six months and proceed at rate of 600 tons per month.

Midvale Steel Company.—Class A, \$420; class B, \$405; class C, \$462; class D, \$512; deliveries to begin in six months and proceed at rate of 600 tons per month.

W. L. C.

The Republic Company Acquires the Martin Coke Works.

John A. Topping, chairman of the Board of Directors of the Republic Iron & Steel Company, authorizes the statement that control of the Martin Coke Works and Connellsville coal lands, heretofore owned and operated by the Bessemer Coke Company of Pittsburgh, has been acquired by the Republic Iron & Steel Company. The property consists of 196 coke ovens and 420 acres of Connellsville coking coal, together with the complete mine equipment, railroad tracks, houses and stores. The Martin coal lands immediately adjoin an undeveloped tract of 500 acres of Connellsville coking coal land known as the Woodside property, which the Republic Iron & Steel Company owns, but which has remained undeveloped owing to the excessive cost of constructing a railroad which would be involved in opening it up. Through the control of the Martin Coke Works, the Republic Iron & Steel Company will now be able to develop the Woodside property, either by means of underground haulage through the Martin mine or by a surface railroad switch over and through the Martin lands.

The Martin Coke Works as a going plant is considered desirable as an operating proposition, aside from the advantages it offers the Republic Iron & Steel Company for developing its adjoining coal lands. The Martin Works mine contains the regular Connellsville seam, and being a drift mine can be operated at a low cost of production. The coke is of standard grade and can be produced at a cost which compares favorably with that of other well located mines in the Connellsville District.

The Republic Iron & Steel Company contemplates improving and extending the productive capacity of the Martin Works, so that within a short time it will become self-contained on coke as it now is on iron ore and pig iron.

Increase in Iron and Steel Operations.

The Republic Iron & Steel Company has increased its blast furnace operations materially since the opening of November. At Thomas, Ala., the No. 1 Pioneer Furnace, which has been idle for a long time, was put in blast last week, so that all three furnaces there are now in operation, which has not been the case for several years. The No. 3 furnace at Thomas has been making good outputs lately, one 24 hours' run showing 330 tons. Of the six Northern furnaces of the company, five are now in operation, one Haselton in the Mahoning Valley having gone out for relining since November 1, while Hannah at Youngstown, Ohio, and Atlantic at New Castle, Pa., have started up. The company has six out of nine rolling mills in operation at about 70 per cent. of their capacity, the idle mills being the two at Birmingham, Ala., and the one at Toledo, Ohio.

OBITUARY.

H. C. HITNER, for many years treasurer of the Potts Brothers Iron Company, Pottstown, Pa., and superintendent of the works, died November 5, aged 66 years.

GEORGE W. SCHWARTZ, Hancock, Pa., for many years an operator of iron ore mines in eastern Pennsylvania and identified with numerous business enterprises in other lines, died November 7, aged 55 years.

WILLIAM EDWARD AYRTON, a noted electrical engineer and inventor, died in London November 8, aged 61 years. He held professorships in various institutions, including that of natural philosophy and telegraphy in the Imperial College of Engineering in Japan.

GEORGE A. FAIRFIELD, Hartford, Conn., until 1906 head of the Hartford Machine Screw Company, died, suddenly, November 9, aged 74 years.

The Reading Iron Company, Reading, Pa., is preparing plans for a new pipe mill, which will be erected to take the place of a rather antiquated mill which is to be abandoned.

The Machinery Trade.

NEW YORK, November 11, 1908.

More activity among practically all lines affiliated with the machinery trade was noticeable the past week, and though as yet the increase of business is only slight, it is believed that it marks the beginning of a steady movement. Merchants are generally more optimistic than for some time past and are glad that no rush to place orders has taken place, believing that a gradual return to normal conditions will better serve all concerned. Had a large demand suddenly developed it is feared that it would be followed by a lull which would tend to retard the growth that has begun. Machinery houses are somewhat encouraged over the slight betterment in their business since our last report; not so much as regards the orders received, but the increase in inquiries and the outlook for the near future. While most houses report an increase in inquiries, as yet these call for only a few tools each. Salesmen on the road are sending in encouraging reports, intimating considerable business soon to be placed, which also in most instances covers small lots individually but in the aggregate amounts to a large sum. The optimism of machinery houses is based to some extent on the renewed activity on the part of the large interests, particularly the railroads, which, though they are buying in a small way, are showing a tendency to come into the market more freely, especially for rolling stock. More orders for cars and locomotives have been placed, and it is expected that they will be followed by substantial purchases of machine tools.

An increased demand for cars and locomotives will necessitate the purchase of a great deal of machine tool equipment, particularly by the builders of locomotives, several of which are preparing to make large purchases as soon as business warrants. The American Locomotive Company has received an order from the Virginian Railroad for 19 locomotives to be built at the Richmond Works, which has been practically idle for some time. This order will keep the plant in operation for some months, at the end of which time it is hoped sufficient work will be received to continue it in operation. Business with the company has gradually increased and it is now operating about 50 per cent. of its capacity. It is expected that the resumption will be slow and that it will be some time before the company will be able to operate at full capacity. The receipt of this order for locomotives is of considerable interest to the machinery trade, in that the American Locomotive Company expects to purchase a large amount of machinery for its various plants as soon as business warrants. It is understood that an appropriation has been made sufficient to cover the entire requirements of the various plants when operating at full capacity and lists of tools have been prepared. It is said that the purchases of machinery will aggregate \$275,000, but it is not likely that these will be made until business increases considerably.

While the volume of orders placed, tentative on the result of the election, in this territory was not as large as that of the previous Presidential election, a number of dealers and manufacturers in the Manhattan District have been recording business during the last few days which is for material ordered with the proviso that the orders be carried out if the election resulted favorably. One machine tool manufacturer in this district has recorded a half dozen orders for tools, mostly in small lots, which were given with that understanding, and an order for a good sized engine was placed with a Corliss engine builder on the same terms. A hoisting engine concern booked a number of orders which were to have been executed only in case of a favorable result of the election, and several dealers report a scattering business of the same character. The dealers report that there is no doubt that a number of orders which were placed in the market since election were a direct result of returning confidence on the part of manufacturers that business conditions would be improved, and there has been a healthy increase in the inquiries of late. This is especially true with power material in all its lines, and considering that the inquiries call for equipment for manufactures in varied lines, it is thought that there will be a general increase of orders before long.

The large shops to be erected at Winnipeg, Man., by the Grand Trunk Pacific Railroad will be constructed under the supervision of the Transcontinental Railway Commission, whose office is at Ottawa, Ont., and from whom details of the project can be secured. We understand that it is the intention to eventually spend about \$1,000,000 in construction and equipment at that point, the first group of shops to be erected involving the expenditure of about \$500,000. Contract has been awarded for the main building, which will be 174 x 823 ft., and it is likely that contracts

will soon be let for the construction of other buildings which are to comprise the plant. These shops will necessitate the purchase of a large amount of mechanical equipment, and as the construction of the shops is likely to extend over a considerable period it is probable that the road will be in the market for machinery for some time to come. The Grand Trunk Pacific Railroad is building an extensive system, and while the main shops are to be at Winnipeg, it is probable that after the entire trackage is in operation smaller repair shops will be located at various points along the line.

The Western Maryland Railroad contemplates enlarging its shops at Hagerstown, Md.

The receivers of the Norfolk & Southern Railroad, in their report filed with the Federal Court at Norfolk, Va., make recommendations for betterments, including \$65,000 for rearrangements and enlargement of shops, including those at New Bern, N. C.

The authority given by the court to F. H. Skelding and H. W. McMasteir, receivers of the Wabash-Pittsburgh Terminal Railroad, to issue receivers' certificates to the amount of \$874,211, probably means the purchase of considerable new equipment at an early date. It is understood that the purchases will include some machine tools.

Plans are being prepared for a large pipe foundry to be erected at Holt, Ala., by the Central Iron & Coal Company, whose main offices are at 37 Wall street, New York. The engineering details are being arranged at Holt, where the company now has a plant, and it will be some weeks, it is stated, before they are completed and in the hands of the company's officials. In the meantime nothing will be done toward buying the equipment. The plant will be devoted to the manufacture of soil pipe in standard sizes, and it will be large enough to enable the company to turn out about 12,000 tons of finished material a year. It has not been decided as yet as to whether the orders for the equipment will be placed from Holt or from New York, and until the plans are entirely completed it is said this fact will not be made known.

The Lozier Mfg. Company, Plattsburgh, N. Y., has been incorporated by local men working through the Chamber of Commerce as a holding company, under which a \$50,000 factory building will be erected and leased to the Lozier Motor Company, manufacturer of automobiles, as an addition to the present plant. Machinery and equipment for the new building will be purchased by the Lozier Motor Company. Plans for the addition have been completed and bids are now being received.

The Water Works Committee of Augusta, Ga., will receive bids until November 24 for a 6,000,000-gal. pumping engine and a 450-hp. steam plant.

The Meridian Water Works Commission, Meridian, Miss., will receive bids until November 24 for a 5,000,000-gal. horizontal cross compound crank and flywheel pumping engine.

Thomas P. Walls and Charles J. Bray have organized the firm of Walls, Bray & Co. and have opened a store at 83 Walker street, New York, which they have stocked with a full line of modern machinery, tools and supplies.

Catalogues Wanted.—The Teknisk Compagni, Prinsens Gade 23, Christiania, Norway, desires to get in communication with manufacturers of American tools and machinery. The company makes a specialty of introducing American manufactured articles in the Scandinavian market and would like to receive catalogues and information on new equipment.

Chicago Machinery Market.

CHICAGO, ILL., November 10, 1908

The events of the week under review have been watched with eager interest by machinery interests, which in common with all other industries, have been looking forward to November 3 as a probable turning point in the sluggish tide of business. Within the few days that have elapsed since election no developments of a striking nature in the way of large transactions have appeared, but there is an unmistakable feeling of stronger confidence already established. Here and there orders for machinery, previously placed contingent upon favorable election returns, have been automatically closed; but such deals were comparatively rare, and so far as this market is concerned, covered no requirements of significant size. Toward the end of the week, however, a number of miscellaneous inquiries for machine tools, that have been hanging fire for some time, have finally resulted in purchases, and the tendency to defer action is less evident than it was. A sale of a dozen machines—the largest of its kind within a year—is reported by one of the leading houses on the street, and a number of other trades pending are likely to be concluded within a few days. Notwithstanding a flood of extravagant rumors regarding the immediate revival of industrial operations that has been turned loose in the past few

days, there is no disposition on the part of the trade generally to indulge in overenthusiastic estimates of what may be expected in the way of improvement in the immediate future. That there will be a gradual increasing demand from this time on for machinery of all kinds is a widely accepted belief, but that it will swell all at once to phenomenal proportions seems wholly improbable to experienced observers.

Dealers' stocks of second-hand tools have been materially increased by recent purchases, and there is a better assortment on the floors of local houses than has been seen for some months. One large shipment from the East was recently received by a prominent dealer, and others have added to their lines by odd lots picked up here and there. The demand for such tools is reported to be relatively good.

A noticeable feature in the field of electrical equipment is the returning interest manifested in traction line enterprises which are rapidly developing throughout the West. Reports of the formation of new companies organized to build and equip interurban and street railroad lines are growing more and more numerous. Some of them doubtless represent speculative ventures, but many of them are well founded business propositions which will sooner or later be able to secure the necessary capital for the execution of their plans.

There is a good deal of activity in plant extension work under way and in prospect in the Union Stock Yards, Chicago, which will greatly enlarge some of the packing establishments in this district. The latest enterprise of this character is an extensive cold storage plant which is being planned as an addition to their present plant by the Morris & Co. packing interests. The building, which will be seven stories in height, covering an area of 214 x 243 ft., will be of reinforced concrete construction throughout. Power for the operation of its machinery will probably be supplied from existing power plants, but a large amount of refrigerating machinery, including pumps and auxiliary equipment, will be required.

The Beatrice Iron Works, Beatrice, Neb., will soon begin the erection of a new factory building, 50 x 150 ft., which will be equipped with up to date machinery suitable for the manufacture of farm implements.

The Dewitt Motor Vehicle Company, North Manchester, Ind., has been incorporated to manufacture motor vehicles.

Plans and specifications for a municipal waterworks system to be installed at Yuba City, Cal., are being prepared by Guy C. McMurtry of that city. They will call for a concrete power house, gas engines, motors, pumps and an 80-ft. steel tower with a 100,000-gal. galvanized steel tank. A cash fund of \$30,000 has been provided for this improvement, and bids for equipment material will soon be asked.

The United Light & Power Company, Silvis, Ill., has begun the erection of a power plant to furnish electric current for light and power in Silvis and East Moline, Ill. For the equipment of the plant the company is now in the market for the following second-hand machinery: One 100 to 150 kw. alternating cycle three-phase generator, boiler and engine of corresponding capacity; 40 series alternating inclosed arc lights; two 25 light regulators, switchboard, &c.

The Peoria Foundry Company, Peoria, Ill., is in the market for motors, cranes, tumbling mills, foundry supplies and elevator for its new fireproof brick foundry building, 60 x 144 ft., contract for the construction of which has been let.

By the bursting of a heavy engine flywheel in the municipal light plant at Frankfort, Ind., October 27, the machinery and building were badly wrecked. On immediate action taken by the City Council a 500-kw. direct connected steam turbine and generator was purchased from the Allis-Chalmers Company, Chicago, and is now being installed. To guard as far as possible against future interruption of service, it has been decided to install a duplicate unit. Bids are, therefore, being asked on a 300 turbine and generator complete, two-phase, 60-cycle; one 75-hp. two-phase induction motor, one condenser for 500-kw. turbine, and one for 300-kw. generator. Bids on this equipment will be received until November 13 at the office of City Clerk Worth Price.

Cleveland Machinery Market.

CLEVELAND, OHIO, November 10, 1908.

With election over and the result regarded as entirely satisfactory by business interests, a decidedly optimistic feeling prevails among manufacturers in general, and this feeling is shared in by builders of machinery and machine tools. The general sentiment for some time has been that all that was needed to bring business back to its normal condition was a complete restoration of confidence, and confidence certainly does not now seem to be lacking. While it is too soon after election to notice in actual sales any decided beneficial effects of the better feeling inspired by the outcome of the election, yet more activity is already being displayed

all along the line. Builders of some lines of tools, whose business showed some improvement during the latter part of last month, report a further improvement in both orders and inquiries. A number of projects for the enlargement of plants and the installation of new machinery, which were held up until after election, it is now expected will be carried out, and some newly incorporated companies will go ahead with the erection of plants.

While railroads are not as yet buying much machinery for shop equipment, an improvement from this source is expected shortly. Builders of heavy handling machinery are getting more inquiries and report considerable improvement in the outlook. Among other lines of heavy machinery the demand for heavy forging machinery, which has been very light for some time, shows a marked improvement.

With the machine tool dealers the market has been quiet during the week, no particular change for the better being noticed as yet. With election over, however, dealers are showing more activity in looking for business. Some orders that were placed by automobile builders conditional on the result of the election were finally closed during the week, and the brighter business outlook following election is expected to stimulate some further buying by some of the automobile people. Many prospective buyers of tools have been holding off, announcing that they would do nothing until after election, and machinery salesmen are now looking for a fair volume of orders from this source. While machinery dealers think the outlook is good, they do not expect a rapid increase in the volume of their business. The end of the year is so near at hand that they expect many who may be considering the purchase of new tools will hold off until the first of next year. A change noted in the condition of the machinery market is that inquiries now are nearly all for new tools. During the greater part of the fall there was about as much demand for second-hand as for new tools.

The Modern Machinery & Engineering Company, 309 Schofield Building, Cleveland, sales agent for the Potter & Johnston Machine Company, reports considerable improvement in orders and inquiries. Several industries that have not previously considered the use of automatic machines have asked for estimates and the indications are that they will result in the placing of orders before the end of the year. Among the orders recently taken by this company is one from the Everett-Metzger-Flanders Company of Detroit for 16 automatic machines for quick delivery. Among the industrial concerns that are considering the installation of automatic machines are those that manufacture water meters, cream separators and small gasoline engines for farm purposes. The water meter industry is said to be developing quite rapidly. In order to demonstrate the broad field for automatic machine work, and to make manufacturers familiar with the new automatics that are being placed on the market the Modern Machinery & Engineering Company will shortly open a demonstration shop in Detroit, where modern methods of producing duplicate work will be shown.

The Everett-Metzger-Flanders Company, Detroit, Mich., automobile builder, is remodeling the Port Huron plant of the Northern Motor Car Company, which it recently absorbed. This plant will be re-equipped especially for the manufacture of rear axles. The Everett-Metzger-Flanders Company will purchase considerable special machinery for the Port Huron plant, and is expected to have its machinery list out soon.

M. J. Hancox has severed his connection with the Standard Pattern Works, Cleveland, and has purchased the plant of the Tumney Copper & Bronze Company on East Sixty-seventh street, which he is now equipping for the manufacture of patterns, and brass, bronze and aluminum castings. A company will be organized to operate the plant under the name of the Industrial Pattern & Bronze Company. The necessary woodworking machinery is now being installed.

The Union Metal Post Company, Canton, Ohio, has increased its capital stock from \$25,000 to \$75,000 for the purpose of providing more capital to extend its line of manufacture. Among other new products that this company intends to place on the market are sheet steel telegraph and trolley poles.

The Royal Brass Mfg. Company, Cleveland, maker of plumbers' brass goods, has increased its capitalization from \$10,000 to \$25,000 to provide capital for the erection of a new plant, including a brass foundry, for the equipment of which the company will soon be in the market. The company will put up a brick plant with about 10,000 sq. ft. of floor space.

The Ajax Mfg. Company, Cleveland, maker of forging machinery, reports the receipt of a number of good orders recently, and that a very satisfactory number of inquiries are now coming in, making the outlook for a good volume of business exceedingly bright.

The Smokeless Heat & Power Company, Cleveland, has been incorporated with a capitalization of \$500,000 for the placing on the market of a new apparatus for the conversion of crude or fuel oil into heat and power. James W. Keenan and others are the incorporators. The company has opened offices in the Hollenden Arcade. The company's product is now being manufactured at Lima, Ohio.

The Grabler Mfg. Company, Cleveland, is making an extensive addition to its plant by the erection of a three-story brick building, 50 x 162 ft., that will be used as a warehouse. Other additions with the view of increasing the capacity of the plant are under consideration.

Harold McGeorge has been appointed district manager for Ohio and western Pennsylvania of the New York Blower Company of Chicago, maker of heating and ventilating apparatus. His office will be at 718-720 Williamson Building, Cleveland.

The German-American Car Company, Warren, Ohio, has found its plant too small for its increasing business and has awarded a contract for the erection of an addition, 28 x 125 ft.

The Wright Auto Horn Company, Cleveland, has been incorporated with a capitalization of \$35,000 by C. H. Quinlan, Robert Wright, Peter J. Mock and H. C. Powers.

Cincinnati Machinery Market.

CINCINNATI, OHIO, November 10, 1908.

Predictions of prominent manufacturers that, with the election over and results satisfactory, the business pendulum would swing back into more normal paths, were true in part at least in this section, for in crude and in some lines of the finished product the improvement has been most marked. Conservatively speaking, however, the machine tool industry's gain as a whole is as yet discernible only in sentiment; but this sentiment is, it must be noted, entirely pleasing, and the manufacturer who does not intuitively feel in the air "better times coming" is a rarity.

Of a dozen large institutions whose heads were interviewed on the subject, the machine tool manufacturers invariably based their conclusions that improvement is in sight more from the tenor of correspondence and general feeling than on actual orders. Taking the central manufacturing community as a whole, however, election results are more than satisfactory, and some fine orders have been placed with manufacturers of woodworking machinery, ice and refrigerator plants and makers of the smaller power units in electrical machinery. Reports from jobbing foundries, too, show a relatively better tone. As a rule the larger jobbing foundries in this territory purchased iron when the price was at the minimum of \$11 and \$11.50 for No. 2 at Birmingham, and most yards show a good condition to take care of rush orders for castings from the tool manufacturers.

The convenience of this market to sources of both Northern and Southern pig iron supply is interesting a number of seekers after locations for industries, most of whom use iron and steel in some form. During the past week arrangements were concluded with the Crown Mfg. Company, Atlanta, Ga., manufacturer of iron beds, for the removal of its plant to Cincinnati. Negotiations, which were conducted through the Cincinnati Industrial Bureau with President P. D. Baker of the company, contemplate the early installation of machinery which will be brought from Atlanta at once into a large manufacturing building in North Fairmount, the home of the Lunkenheimer Company and other large Cincinnati institutions, and the beginning of operations by the first of the year. The plant will have a capacity of 300 beds a day and will give employment at the start to about 100 hands. The business at Atlanta will be continued as a finishing and distributing branch for the South and Southeast, but all the manufacturing will be done in Cincinnati. President Baker will make his home in Cincinnati, as will also several heads of departments whom he will bring from Atlanta.

In the rebuilding and reorganization of the shops of the Wheeling & Lake Erie Railroad Company at Norwalk and Ironville, Ohio, a number of manufacturers of woodworking machinery and machine tools in this district are anticipating some large business. Since the election a good portion of the woodworking machinery needed for these shops has been placed, and the largest makers of machinery of this class, located in Cincinnati, will be the gainers. The shops at Ironville, Ohio, a suburb of Toledo, will, it is understood, soon place specifications for equipment of tools needed.

The quarterly dinner of the Cincinnati Metal Trades Association, set for December 10, is expected to be the most important and enjoyable table function of the year in local metal trade circles. Secretary Manley is now busied with the details of speakers and other matters.

A convention of the week in which Cincinnati machinery manufacturers are interested as a class is that of the Tri-State Vehicle and Implement Dealers' Association, which will be in session three days and by Wednesday is expected to reach an attendance of 2000. The president is H. M. Clemens, Cannelton, Ind.; the secretary, P. T. Rathbun, Springfield. President Clemens, in speaking of the programme, notes that three important subjects to engage the attention of the convention are the parcel post, terms and prices, and the fertilizer trade.

One of the best of the after election orders placed in this section was that of the 70-ton ice plant for the Dayton (Ohio) Ice Mfg. & Cold Storage Company. The Triumph Ice Machine Company got the order, amounting to about \$50,000, and the plant is to be finished by February 1 and in operation by April 1. The Triumph Company reports the outlook most excellent in this line.

In the announcement of the Queen & Crescent Railroad officials that men will be gradually reinstated in their old positions as fast as conditions justify tool manufacturers in this territory find considerable satisfaction. Most of those now going on are assigned to positions in the repair shops, which will necessitate rehabilitation of the toolrooms.

It is announced from Huntington, W. Va., that the Globe Foundry Company, which owns a plant valued at \$75,000 that has not been in operation for several months, will arrange to commence operations in a few weeks, giving employment to several hundred men.

The incorporation at Columbus of the United States Can Company, with a capital stock of \$100,000, to operate a factory at Norwood, Ohio, was an incident of the week. C. Huffman, Guy Mallon, S. C. Donahue, Charles J. Fitzgerald and Harry W. Vordenburg are the incorporators.

The Columbus Structural Steel Company, Columbus, Ohio, is enjoying a fine line of inquiry for structural material for the building of electrical arches across streets of large cities. A recent order is from Manchester, N. H., for 17 of these arches. Another similar order came from a city in Texas. The company reports several other good orders in sight.

The Delphos Mfg. Company, Delphos, Ohio, has completed a two-story brick and iron warehouse, 80 x 80 ft., and a frame and galvanized iron structure, 70 x 200 ft., to be used as a galvanizing department in which two pots will be operated. It is the intention to use the building now occupied by the galvanizing department for the manufacture of galvanized ware after January 1. Plans have been prepared for an office building, 42 x 60 ft., two stories and basement, at an estimated cost of \$12,000. The company has also added another siding to its plant which will hold 24 cars, giving a siding capacity of 36 cars, and has purchased land adjoining its property where it will erect additional buildings, contracts for which have been let. The company is receiving such a large demand for its products that it has been obliged to double its capacity.

New England Machinery Market.

BOSTON, MASS., November 10, 1908.

All branches of the machinery trade exhibit tangible evidence that the passing of the election has had the expected pronounced influence on manufacturing business. In the machine tool market the increasing demand which made October a better month than September shows a growing gain in orders booked, but the volume of new business does not by any means equal what it is expected to be in the early future. Inquiries have assumed a very different tone, having to do with capacity and adaptability for work, and with deliveries, price dickering having been discontinued. In some cases recent orders for single machines have been followed by requests for information, which indicate the purpose to purchase other tools of the same class. Dealers are considering increasing their stocks because the market is for machines for immediate shipment. This appears to be an important feature of the situation. Purchases are in most cases the carrying out of plans made while business was quiet. Users of machinery have carefully looked over their works to secure exact knowledge of improvements which should be carried out before the return of prosperous times. Definite plans were made even to the decision as to make of tools. But lack of confidence impelled most buyers to hold off with orders. Now they are ready to place their business. They do not wish to be delayed and ask for immediate shipments, if possible, from the store or warehouse of the dealer. It will not take long to deplete these stocks, and the dealers should soon be placing handsome orders with their manufacturers, some of whom are in position to supply without delay any demand that may be made on them. With other machine tool establishments a sudden heavy increase in demand might mean that within a short time deliveries would become delayed, for there are small stocks in their storerooms.

The machine tool builders share the great confidence which prevails in other lines of business, including banking. They feel that they will have a gradual improvement in business, until by the beginning of next year their works will be running full. Their orders are increasing in number and are assuming a different character. Where practically all new business was in machinery somewhat special in design, the new orders are for the standard types. The shops are gradually increasing working forces. Some of them are back on full time, but there are few cases where they are running with full working forces.

In the machine tool trade there is some talk of an in-

crease in prices. Some of the manufacturers profess to believe that by the time of the annual meeting of the National Machine Tool Builders' Association in the spring conditions will warrant a 5 or 10 per cent. advance. The trade is in a most advantageous position at this time in meeting a rising market, for almost without exception prices are where they were when the slump came, a year ago.

The supply trade is awakening sharply. The dealers report largely increased orders, chiefly from the smaller manufacturers, the larger concerns not having entered the market to any great extent, up to the present time. The Fairbanks Company, for instance, which carries a widely varying line, reports a betterment in every department. Monday's mail was the largest received for six months and more. This is a typical example of the trade. Inquiries are numerous.

Every line of manufacturing reports the changed condition of business. The awakening of industry is widely extended, there being practically no exceptions. All kinds of machinery, general metal manufacturing, brass in all its extensive applications and the widely varying list of miscellaneous industry have all felt the improvement. In Providence the revival of the jewelry manufacturing business has been reflected among the machinery people who supply this trade, constituting a by no means small industry. The confidence which has been needed apparently permeates all business interests, which is the first preliminary to good times. With hardly a week elapsed since the result of the election was known the change in this section is almost extraordinary, and the same story reaches here from other parts of the country.

Reports of new industrial plants and extensions of existing works are heard. They are as a rule rather vague, details being withheld by those who come in touch with them, because they hope to profit by being first in the field with new customers, probably some of these stories are not well based on fact. Promoters are already astir to take advantage of conditions better suited to the carrying out of their schemes, and probably they are the source of some reports of large industrial enterprises.

As has been stated, it is a little too early to see the actual results of the election. In a general way it is everywhere evident that there will be an increased business. Many of the newspaper reports are exaggerated; there is not so radical an actual change as would appear from some of the press dispatches. The indications are that lines of manufacturing close to the consumer will soon be rushed with orders; many of them are now running full normal capacity. The machine tool trade will not return to so strong a basis quite so soon, unless this is an exception among the periods following a business depression. The manufacturers look for a gradual increase in orders, probably accelerating in speed with the passing of the final weeks of the year. The year 1909 is regarded as certain to be a full one. There is a natural buoyancy of spirit, coming with the knowledge that the hard times are a thing of the past. That the end is at hand so early is regarded with pleased surprise by some of the prophets who believed that the season of depression would extend well into 1909. But it should not be lost sight of that a speedy return to normal conditions may be followed by a slight reaction, resulting from the finishing of the process of stocking up.

The railroad shops are getting back to full capacity. The great locomotive and car repair shops at Readville, Mass., the largest of the kind in New England, resumed full time yesterday, and it is understood that the Boston & Albany and Boston & Maine shops, as well as those of the minor systems of northern New England, are preparing to do likewise, where they have not already re-established their normal capacity. Interest is revived in the proposed shops of the New York, New Haven & Hartford, which will eventually be established to take care of the rolling stock of the western end of the system, and which will be on a scale commensurate with those at Readville. No definite statement has been made by the company, but the announcement that New Haven or some other center in western Connecticut had been chosen as a site, and that work would go on immediately would create no surprise.

Business is improving with the builders of textile machinery. The large works of the Howard & Bullough Mfg. Company, Pawtucket, R. I., have gone back to full time, and recent purchases of equipment by other companies building similar lines of machinery indicate that an increasing activity is either already felt or confidently expected.

New England foundries are doing a larger business, which promises to improve still more within a short time. The pig iron people report that a large tonnage of orders has been booked in this section since election. Buyers are anxious to place contracts extending as far into 1909 as possible, but the furnaces are limiting this, all of them declining to accept business beyond the first half, while many others, comprising the majority, are limiting their contracts to the first quarter. Southern furnaces have retired from the market. Prices continue unchanged so far as is known in New England, though there is a general stiffening.

The American Optical Company, Southbridge, Mass., is to erect a large factory building, preliminary work on which has begun. Details of the plans are not yet available, but the new building will have large capacity and will be devoted to the lens department. It is proposed to build a large power plant later.

H. N. Case, recently with the Becker Milling Machine Company, Hyde Park, Mass., will be the head of the machine tool department of the Fairbanks Company, Boston.

The Standard Gauge Mfg. Company, Waterbury, Conn., which will operate a large plant at Foxboro, Mass., has been incorporated under Connecticut laws with a capital stock of \$300,000. The incorporators are Bennett B. Bristol, Edgar H. Bristol and Watson E. Goodyear. The company states that this is a reincorporation of the Standard Gauge Mfg. Company of New York, the capital stock being increased to the figure named. The company has been located at Syracuse, N. Y., whence the business will soon be moved to Foxboro. The line already manufactured at Syracuse will be continued at Foxboro, together with other products which may be decided upon later.

The Crown Mfg. Company, South Norwalk, Conn., has been incorporated in Connecticut with William S. Sturtevant, Norwalk, president; Millard G. Sturtevant, Norwalk, secretary and treasurer, and Morris Yeager, Philadelphia, vice-president. The company will manufacture patented machinery, and plans to establish a machine shop and foundry at South Norwalk, though not immediately. The present headquarters are 33 Elmwood avenue, South Norwalk, and 621 Broadway, New York.

The Sagamore Mfg. Company, Fall River, Mass., textile manufacturer, has voted to build a new mill to cost \$300,000.

Philadelphia Machinery Market.

PHILADELPHIA, PA., November 10, 1908.

Now that the Presidential election has been disposed of, and in a manner that has been pretty generally satisfactory to the trade, a forward movement in business all along the line is expected. In fact, in some instances this has already made itself felt. The machine tool trade has developed signs of improvement, not that any great rush of business has come, but along with a slight increase in orders is the generally better feeling, with expressions of confidence in the future. Plans and policies which have laid dormant for some time are again being talked of, and will be taken into consideration. As far as actual buying is concerned, time will be required, and if there is a moderate steady gain in the next few months the trade will be pretty well satisfied. A good volume of business which was held up, pending the result of the election, will come out, some having already developed, but this has been mainly the small propositions, the larger ones continuing to move slowly.

The attitude of the railroads is decidedly encouraging. In addition to the order placed early last week by the Pennsylvania Railroad for the electrification of its New York terminal lines, this road has placed a large order for steel passenger cars. Other roads are placing orders for rolling stock and maintenance of way purposes, and while these do not affect the machine tool trade, as far as the railroads are concerned, it strengthens the general situation to a considerable extent.

Manufacturers express themselves as well satisfied with the present outlook. Considerable business, more particularly in the nature of special equipment, has been placed. Scattered orders for standard machine tools have also been taken, but it is from the volume of inquiries that have been received that the machine tool builders take the most encouragement, as it is believed that just as soon as industrial plants begin to get more fully occupied they will take up the question of needed additions to their equipment and place the necessary orders. Heavy increases in production of machine tool plants are not looked forward to at the time, particularly those making tools of the standard types, as practically all are carrying heavy stocks which must be moved, in part at least, before production will again be forced. The general tone of the machinery market is better, however, and the trade looks forward to materially increased activity early next year.

The export trade does not show material improvement. There has been some demand for special machinery and equipment, but for standard types of machine tools the inquiry is rather light. In the smaller lines of specialties, particularly power transmission purposes, a shade better demand is reported, but the volume of business continues small.

There has been a fair demand for second-hand machine tools. This branch of the trade also feels the generally better conditions, and while the volume of business taken has not been particularly large, there has been an increase in the sales of some classes of equipment. Transactions continue largely on the single tool basis and are mostly of a small or medium size, with probably an increased inquiry

for those of the heavier types. Second-hand engines and boilers appear to be in slightly better demand, but the trade is irregular. A few propositions of the larger type are under consideration, particularly in new equipment, but they develop slowly.

The foundry trade has a somewhat better tone, in some cases both iron and steel casting plants having taken increased tonnage, but few are able to work up to anything like normal capacity. The increased demand from the railroads is expected to be felt by the foundry trade before a great while. Current orders are small and to a great extent cover only immediate needs of consumers.

The Board of Trustees of the State Hospital at Warren, Pa., will receive bids until November 17 for furnishing and installing two 80-hp. natural gas engines and two triple power pumps of approximately 955 gal. per minute capacity. Specifications and particulars may be obtained from Charles R. Simpson, engineer, State Hospital, Warren, Pa.

The South Jersey Realty Company, 918 Real Estate Trust Building, Philadelphia, which is developing Stone Harbor, at Seven Mile Beach, N. J., is taking bids for the installation of a sewage disposal plant and laying of sewer pipes, also for a water supply plant, the water to be obtained from an artesian well to be driven 875 ft. Plans and specifications are to be had at the office of the company or from R. L. Goff, engineer, Ocean City, N. J.

Some 60 bids were opened by Director J. G. Klemmer of the Department of Supplies for the city during the past week. These were for requirements of the different departments during the coming year and covered cast iron water pipe and castings, bolts, nuts, washers, fittings, valves, iron and steel and supplies of a general nature, costing in the aggregate about \$200,000. The bids are now being scheduled, and it is believed that the awards will be made the current week.

The Montross Metal Casket Company, with offices in the Weightman Building, in this city, has abandoned its intention of erecting a manufacturing plant in Wilmington, Del., and has purchased from the receiver the plant of the Pope Mfg. Company, Hagerstown, Md. This plant it finds well adapted to its needs, a 250-hp. Corliss engine and steam plant being already installed. Additional orders are being placed by this company with the Ferracute Machine Company, Bridgeton, N. J., for presses and dies, and as soon as the purchase of the Pope plant has been confirmed by the courts, it will be in the market for additional equipment, including machine tools, &c.

The Department of Public Works, city of Philadelphia, will receive proposals until November 17, for furnishing a quantity of lamp posts for the city in 1909. Specifications regarding these may be obtained from the Bureau of Lighting, Room 334, City Hall, or from Director George R. Stearns, City Hall.

Deinelt & Eisenhardt, Inc., report quite a large number of inquiries coming in, with a small increase in the resulting business. The demand for dead stroke hammers and hydraulic jacks has picked up considerably, and orders for several of each have recently been booked. This concern has under construction two large oil cloth printing machines as well as several Lovekin pipe expanding machines, one of the latter, a class B machine, taking in pipe up to 14 in. diameter, will shortly be shipped to the Norfolk Navy Yard. The outlook for the future is considered very bright.

The Philadelphia Roll & Machine Company has taken quite a volume of business the past few weeks, and expects to put its plant on full time in the near future. Orders recently taken include a complete 18 in. merchant mill, a number of sets of sheet mill rolls and sand rolls and charcoal iron castings. A large order for special annealing pots has also been booked. Inquiries have increased materially, and some very satisfactory business is expected to develop in the near future.

The Ridgway Dynamo & Engine Company, Ridgway, Pa., has moved its Philadelphia office from the Girard Building to 1017 Witherspoon Building, and has placed the office under the management of Robert S. Beecher, who is well known in the steam engine trade. With its additional lines of side crank engines and the rapidly improving business conditions throughout the country, the company reports bright prospects for a largely increased volume of business during the coming season.

Government Purchases.

WASHINGTON, D. C., November 10, 1908.

The Isthmian Canal Commission will receive bids until November 30, Circular No. 478, for marine boilers, automatic water measuring tanks, electric drill, wood boring machine and other supplies.

The opening of bids for three rapid unloading cranes for the Isthmian Canal Commission, under Circular No. 475, has been postponed from November 16 to November 24.

Bids will be received until November 12 at the office of the Public Health & Marine Hospital Service, Washington, D. C., for one lathe, one drill, one pipe machine and one 5-hp. motor.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until November 21 for refrigerating machinery for the naval station at Culebra, P. R.

The following bids were opened November 3 for machinery for the navy yards:

Class 61.—One improved tool and cutter grinder—Bidder 59, Fairbanks Company, New York, \$456.50 and \$322; 66, Frevert Machinery Company, New York, \$360 and \$392; 123, Manhattan Supply Company, New York, \$415; 131, Norton Grinding Company, Worcester, Mass., \$415; 205, Vermilye & Power, New York, \$431.50; 210, Woods Engineering Company, Alliance, Ohio, \$325.

Class 71.—One semi-universal grinding machine—Bidder 64, W. H. Foster Company, New York, \$6749.50.

The following bids were opened November 2, Circular No. 473, for machinery for the Isthmian Canal Commission:

Class 14.—Five pneumatic geared hoists—Bidder 22, Chicago Pneumatic Tool Company, New York, \$1100; 32, Detroit Hoist & Machine Company, Detroit, Mich., \$1014; 47, Fox Brothers & Co., New York, \$1276.18; 62, Ingersoll-Rand Company, New York, \$1137.50; 85, New Jersey Foundry & Machine Company, New York, \$1075; 126, Tucker Tool & Machine Company, New York, \$1045.

Class 16.—One combined hand and power pipe threading and cutting machine—Bidder 4, Baird Machinery Company, Pittsburgh, Pa., \$939; 5, F. S. Banks & Co., New York, \$898; 37, Drew Machinery Agency, Manchester, N. H., \$1812; 43, Fairbanks Company, New York, \$1380; 47, Fox Brothers & Co., New York, \$857.94 and \$1183.06; 49, R. W. Geldart, New York, \$1290; 55, Handlan-Buck Mfg. Company, St. Louis, Mo., \$792.75; 68, Knox & Brother, New York, \$763; 74, Manhattan Supply Company, New York, \$2244; 93, J. L. Osgood, Buffalo, N. Y., \$831; 126, Tucker Tool & Machine Company, New York, \$919 and \$1300; 134, Vermilye & Power, New York, \$750; 138, Francis T. Witte Hardware Company, New York, \$950.

Class 17.—One geared shaper—Bidder 4, Baird Machinery Company, Pittsburgh, Pa., \$488; 43, Fairbanks Company, New York, \$495; 47, Fox Brothers & Co., New York, \$464 and \$434.49; 55, Handlan-Buck Mfg. Company, St. Louis, Mo., \$412.50; 77, Motley, Green & Co., New York, \$458; 88, Niles-Bement-Pond Company, New York, \$478; 93, J. L. Osgood, Buffalo, N. Y., \$563.

Class 18.—One motor driven grinder—Bidder 23, Cincinnati Electric Tool Company, Cincinnati, Ohio, \$29.80; 26, James Clark, Jr., Electric Company, Louisville, Ky., \$45; 49, R. W. Geldart, New York, \$45; 55, Handlan-Buck Mfg. Company, St. Louis, Mo., \$54; 58, Hisey-Wolf Machine Company, Cincinnati, Ohio, \$39; 74, Manhattan Supply Company, New York, \$70.50; 78, National Electrical Supply Company, Washington, D. C., \$45; 93, J. L. Osgood, Buffalo, N. Y., \$38; 126, Tucker Tool & Machine Company, New York, \$34.75 and \$39.75; 129, United States Electrical Tool Company, Cincinnati, Ohio, \$45.

Class 19.—Eight electric drills—Bidder 22, Chicago Pneumatic Tool Company, New York, \$720; 23, Cincinnati Electrical Tool Company, Cincinnati, Ohio, \$769.52; 26, James Clark, Jr., Electric Company, Louisville, Ky., \$728; 49, R. W. Geldart, New York, \$752; 58, Hisey-Wolf Machine Company, Cincinnati, Ohio, \$744; 78, National Electrical Supply Company, Washington, D. C., \$760; 126, Tucker Tool & Machine Company, New York, \$768 and \$720; 129, United States Electrical Tool Company, Cincinnati, Ohio, \$640; 133, Van Dorn Electric & Mfg. Company, Cleveland, Ohio, \$800.

The following bids were opened October 30 at the office of the Isthmian Canal Commission for two electric air compressor units:

Chicago Pneumatic Tool Company, New York, \$4280; Ingersoll-Rand Company, New York, \$7000; Sullivan Machinery Company, Claremont, N. H., \$5454 and \$5573.

The American Locomotive Company, New York, will be awarded contract for furnishing the Panama Railroad 12 freight oil burning locomotives of the mogul type at \$11,950 each. Bids for these locomotives were opened October 28.

Under bids opened August 25 for machinery for the navy yards, the Fairbanks Company, New York, has been awarded the following classes under supplementary opening: 120, two spiral geared planers, \$3232; 121, one spiral geared planer, \$2193; 122, one spiral geared planer, \$2354.

Under bids opened September 1 for machinery for the navy yards, the Prentiss Tool & Supply Company, New York, has been awarded class 18, one horizontal boring and drilling machine, \$1719.

The following awards have been made for machinery for the navy yards, bids for which were opened October 13:

William L. Sargent, Fitchburg, Mass., class 1, one universal grinding machine, \$1074.

Ferracute Machine Company, Bridgeton, N. J., class 3, one power punching press, \$390.

Haillide Machinery Company, Seattle, Wash., class 4, one 16-in. by 10-ft. engine lathe, \$1130.

Garvin Machine Company, New York, class 25, one 24-in. screw cutting engine lathe, \$1767.

Manning, Maxwell & Moore, New York, class 6, one full universal radial drill, \$1650.

Chicago Pneumatic Tool Company, New York, class 7, four pneumatic hammers, \$86.

Under bids opened October 26, Circular No. 472, for machinery for the Isthmian Canal Commission, Fairbanks, Morse & Co., Chicago, Ill., have been awarded class 1, one piston pump, \$62.

Under bids opened October 26, the Vulcan Iron Works, Wilkes-Barre, Pa., has been awarded contract at \$5900 for two four-wheel saddle tank locomotives for the Isthmian Canal Commission.

One statement contained in the article on page 1289 in *The Iron Age* of November 5 on "Benson Mines Developments" was in error. John C. Eden and A. W. Thompson are still directors of the company and retain their stock interests.

HARDWARE

NEXT week at Memphis, there will be a most important gathering of the Hardware trade, as the AMERICAN HARDWARE MANUFACTURERS' ASSOCIATION, representing the makers of Hardware, and the NATIONAL HARDWARE ASSOCIATION, made up of nearly 200 prominent distributors of Hardware, hold simultaneous conventions and meet in various ways in joint session. There will also be, in accordance with recent custom, a delegation from the NATIONAL RETAIL HARDWARE ASSOCIATION, who will be the representatives of many thousands of retail merchants. Delegates, more or less formally accredited, will doubtless be present from other organizations connected with the different branches of the trade. Taken all in all, it will be a great gathering and should accomplish something for the advantage and advancement of the trade. Each of the great associations thus brought together in related, though separate meetings, has important questions concerning the policy to be pursued with a view to promoting the welfare of its members, but at the same time it should be mutually advantageous to discuss in a reasonable and fraternal spirit any matters in which there is difference of opinion or clash of interest. While the members of one of the associations are in general the customers of the other, it is gratifying to chronicle the increasingly dignified and independent spirit which characterizes the relations of the two bodies.

It is admitted with practical unanimity by business men that the laws enacted to prevent combinations and agreements in restraint of trade need modifications. The law, as has frequently been pointed out, recognizes no distinction between reasonable and unreasonable agreements or understandings affecting the price or production of goods, but brands every concerted effort at the maintenance of price or the limiting of competition as illegal. It is no defense that the course pursued is equitable and even necessary, nor that it is in its results beneficial to the trade, and allows the making of lower prices. If there is any agreement in limiting competition or in restraint of trade it is a violation of the law. The matter was forcibly stated by the president in his last annual message when he characterized the law as "such that the business of the country cannot be conducted without violating it." Practically every branch of trade is honeycombed with infractions of the law. Pools which are obviously illegal have been dissolved, but somehow or other things go on practically as before. Combinations are given up, and agreements thrown overboard, but the manufacturers or merchants by some strange mental operation hit upon and maintain identical prices. Prices are now made by "concurrence." They happen to be uniform and identical. It would be hard to find a line of business—excepting, of course, the Hardware and Iron trade—in which the law does not force men into a false position. Understandings which are reasonable, and, indeed, essential, to the successful conduct of business are, according to both the letter and the spirit of the law, illegal, and honorable men are driven to quibbling and equivocation when their own interests and the interests of the trade at large call for some kind of concert of action in the making, selling or buying of goods. If there had not been something of this kind during the past year we should have reached the anniversary of the great panic with depreciated values, and

the wreckage resulting from an utterly unrestrained competition.

At the last great Hardware gathering action was taken asking for a modification of the law so that it would prevent unreasonable and mischievous agreements, but would permit such co-operation and agreements in trade as are reasonable and necessary. The associations have, however, not taken hold of the matter in an earnest, resolute manner. They have not pointed out forcibly the injustice of the law, the hardship it entails and the mischief which would be caused by an attempt to enforce it against all offenders. Nor have they emphasized the impolicy and peril there is in leaving to the Government the option of selecting for investigation and prosecution a few out of the many violators of the law. The Memphis associations are great representative bodies. If they speak in decided tones their deliverances will have weight. Other associations will give heed and declare themselves, so that a just view of the question will be brought to the attention of the lawmakers.

Condition of Trade.

There is unquestionably a better tone in the Hardware market, as well as in the market at large. Orders are coming in to Hardware manufacturers and jobbers more freely and cover a greater variety of goods. This condition appears to result not from any special expectation of higher values, but from the development of a more matured confidence in returning prosperity. Some manufacturers, indeed, report that recent orders are very gratifying in their volume, and they look upon them as a happy indication that trade is getting back to something like normal, even when judged by the recollection of the swift pace of recent years. But without making too much of the evident improvement there is certainly a hopeful tone in the market at large which presents a very striking contrast to the dismay and apprehension which prevailed a year ago. At that time there was the necessary curtailment of expenditure and business activity, while now with abundant money there is a general resumption of enterprise and increasing attention to the cultivation of trade along practically all lines of effort. The more full employment of the railroads is one of the indications of the growing volume of business, with the prospect that some of them will have their capacity taxed by the moving of the crops and the carrying of merchandise. In this encouraging condition of things the Government's report that the yield of corn is 50,000,000 bushels greater than last year, and that there is a much greater proportionate increase in the cotton crop has a good effect, and is another reminder of the prosperity of the agricultural classes, which must ultimately extend its influence beneficially through all the channels of trade. The advance in Copper is affecting the quotations on many Copper goods, and, whether or not the increase in price is to be regarded as normal and healthful, the announcement of higher prices acts as something of a tonic on the market. Prices, however, in Hardware generally do not show important change, and in some directions weakness seems to be developing. There are, however, here and there advances, the result of reaction from low prices. It is generally recognized that a reasonable decline in goods

which are sold at a high level would be advantageous in the long run, and regarded in this light a softening of the market may, indeed, be indicative of a return to a healthful condition of things.

Chicago.

With the perplexities and doubts incident to a strenuous Presidential campaign—complicated, as it was, by a widespread lethargy of business—now finally settled and out of the way, there seems to be an open course ahead for the active development of plans and policies for the future extension of commercial and industrial activities, which, it is confidentially expected, will have a reviving influence upon all lines of manufacture and trade. Measured by the actual amount of new business placed since November 3, post-election developments have thus far produced no results of stirring importance; and it is indeed well that this is the case, as it affords reassuring evidence of the controlling force of conservative judgment and action, which must of necessity underlie the re-establishment of trade upon a stable basis of permanent prosperity. If not immediately expressed in concrete terms, results beneficial to the market are observed in the more cheerful tone everywhere apparent and in the expressions of renewed confidence heard on every hand. That this feeling will find fuller expression in a larger volume of business a little later on can hardly be doubted, for, taking into consideration the depleted condition of stocks in the hands of manufacturers and dealers, there is now no serious obstacle in the way of a freer movement all along the line as soon as the consumptive demand begins to assert itself more strongly. Trade in Wire Goods is fully up to expectations, and shipments of Wire Nails and Fencing now going forward reflect the general distribution of wealth conferred by bountiful crops upon farmers throughout the West. Prices announced last week on Wire Cloth for the coming season conform to those in force at the opening of last season, with the exception of a slight reduction on Bronze Cloth. These prices to retailers are: For 12-Mesh Black Cloth, \$1.30; 12-Mesh Galvanized, \$1.90; 14-Mesh Bronze, \$6.50. The continuance of mild open weather has favored outdoor building construction, in consequence of which the demand for Builders' Hardware is holding up remarkably well, considering the lateness of the season. Upon application to the court by some of the representative local Hardware dealers and other sellers of Firearms, a temporary injunction against the enforcement of a city ordinance making it unlawful for any person to purchase such weapons without first procuring a license from the city, has been granted. This ordinance was designed to prevent the indiscriminate sale of weapons to the criminal element, but has proved ineffective to this end. Because of its drastic provisions its chief effect was to divert not only this trade, but legitimate buyers as well, to suburban towns, where Arms can be procured without restriction. The case will come up for final hearing upon the question of making the injunction permanent at an early date.

NOTES ON PRICES.

Wire Nails.—The market continues in excellent condition, with an increased activity in purchasing. Specifications on contract orders, are also being received by the mills quite freely. There appears to be an inclination on the part of jobbers to be less conservative in the quantity of Nails they order. According to reports, regular prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$1.95
Carload lots to retail merchants.....	2.00
Less than carloads to jobbers.....	2.00
Less than carloads to retail merchants.....	2.10

New York.—Wire Nails are moving fairly well in the local market, but orders are usually restricted to comparatively small lots. Urgent requests for prompt shipment accompanying most orders show that retailers' stocks are light. Nails are held on the basis of \$2.30

per keg in small lots at store, but some sellers are occasionally inclined to shade this figure.

Chicago.—A marked increase in new business developed last week, which resulted in raising the daily tonnage average beyond what is generally reckoned a normal average. This is due to a feeling of confidence in the soundness of business conditions and firm belief in a good future demand. Specifications are coming out at a good rate, and the mills are now operating at not far from normal capacity with every prospect of being fully engaged before the end of the year. Prices are reported to be regularly maintained. Quotations are as follows: \$2.13 in car lots to jobbers, and \$2.18 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—So far this month actual orders for Wire Nails booked by the leading mills show an increase over the corresponding period in October, and it is believed that tonnage entered by the mills in November will be considerably heavier than in last month. Specifications against contracts are also coming in freely and general conditions in the Wire Nail trade are referred to by the manufacturers as being quite satisfactory. Jobbers are also showing some disposition to anticipate requirements and are placing more liberal orders. We are advised that regular prices are being absolutely maintained. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$1.95
Carload lots to retail merchants.....	2.00

Galvanized Nails are quoted at \$1 over the price of the regular Nails.

Cut Nails.—There is a slight improvement in the condition of the market, shown in the receipt of specifications on contract orders and in new business by the mills. The improvement is moderate, however, and the demand is only for present requirements. The general price for Steel Cut Nails is \$1.80, base, per keg, f.o.b. Pittsburgh, for less than carloads, and \$1.75 for carloads and larger lots. In the Western market Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

New York.—In the local market Steel Cut Nails are in moderate demand. Steel Cut Nails are held on the basis of \$2.15 per keg for small lots at store, but this price is not strictly adhered to by all sellers.

Chicago.—The rate of improvement in the demand for Cut Nails is by no means rapid, but some encouragement exists in the fact that it is slowly advancing. Orders continue to cover only actual needs, which in some quarters are gradually expanding. Prices are reasonably firm on small lots, but are shaded 5 cents a keg, carloads. We quote Chicago prices as follows: In car lots to jobbers, Iron Cut Nails, \$2.08; Steel Cut Nails, \$1.98.

Pittsburgh.—There is a moderate new demand, and specifications against contracts are coming in fairly well. It is believed that shipments of the Cut Nails by the mills this month will show a fair increase over last month. We are advised that prices are quite firm, concessions having almost entirely disappeared. The general market is \$1.80, base, per keg, f.o.b. Pittsburgh, but \$1.75 is made, on carloads and over. In the Western market Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

Barb Wire.—Fall business is being somewhat prolonged by mild weather, but demand has not been up to manufacturers' anticipations for this season. According to reports regular prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.10	\$2.40
Retailers, carload lots.....	2.15	2.45
Retailers, less than carload lots.....	2.25	2.55

Chicago.—Although fall buying is usually pretty well over by this time, continued mild weather is bringing out a fair amount of new business. Buying for spring trade will soon begin in Southern territory, when an increased

volume of business is expected. We are advised that regular prices are firmly maintained. Quotations are as follows: Jobbers, Chicago, car lots, Painted, 2.28; Galvanized, \$2.58; to retailers, car lots, Painted, \$2.33; Galvanized, \$2.63; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, bright, in car lots, \$2.25; Galvanized, \$2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—New orders being entered by the mills are more numerous and for larger quantities, but at the same time conditions are not quite as satisfactory as anticipated by the mills some time ago. The situation is encouraging, and it is believed new orders will soon show a material increase. We are advised that regular prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.10	\$2.40
Retailers, carload lots.....	2.15	2.45
Retailers, less than carload lots.....	2.25	2.55

Plain Wire.—Conditions in the Plain Wire market are more encouraging than those in the market for Barb Wire, in that present demand is larger and the outlook for the future is better. Manufacturers of Wire Fencing anticipate a good business and are ordering Wire in a moderate way for future requirements. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of \$1.80 for Plain and \$2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....	\$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35	2.35
Galvanized.....	2.10	2.15	2.20	2.25	2.35	2.45	2.55	2.85	2.95

Chicago.—Specifications against contracts are being furnished without hesitation and more new business is coming out. The Fence manufacturers look forward to an active season, and judging from the purchases reported, they are now disposed to anticipate their wants farther ahead. Mill prices, we are advised, are being firmly held. We quote as follows: Car lots to jobbers, \$1.98, f.o.b. Chicago, and to retailers, \$2.05.

Pittsburgh.—Heavy orders for Plain Wire are now being placed by the Fence manufacturers, who are showing a disposition to anticipate their wants. At the same time there is a disposition not to contract too heavily, but with the election out of the way, the mills confidently anticipate a material increase in new business. The mills advise us they are absolutely maintaining prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.10	\$2.40
Retailers, carload lots.....	2.15	2.45
Retailers, less than carload lots.....	2.25	2.55

Brass Butts.—Decided firmness is observed in quotations on Wrought Brass Butts, due in large measure to the advance in raw material. It will be remembered that prices on this line were heavily reduced some time ago, since when no improvement has yet been observed. Some buyers show a disposition to keep their stocks pretty well filled up.

Solder.—Solder has steadily maintained a stronger tendency and now rules approximately 1 cent per pound higher than two or three weeks ago. Advances in Tin and Lead have of course been the influential factors in the market.

Bolts and Nuts.—The monthly meeting of Bolt, Nut and Rivet manufacturers will be held this week. Some persons seem to believe that prices will be advanced, but the conservative question the wisdom of an upward movement just at this time as likely to impede progress, and suggest the advisability of making haste slowly.

Brass Cocks, Valves, &c.—The improvement in the Copper and Brass market is having its effect on Brass Cocks of various kinds, Valves, &c. The prices of most manufacturers have been withdrawn on these lines, and some have made advances of 5 per cent. or so on certain classes of goods.

Cabinet Locks.—A reduction of about 10 per cent. in a few styles of flat key Cabinet Locks has recently been

made by some manufacturers. The change brings the price of certain numbers of chest, drawer and wardrobe Locks down to the figures prevailing before the advance made the first of the year.

Wood Screws.—Announcement is made that prices on Wood Screws have been reaffirmed up to July 1, 1909.

Sheet Copper.—Sheet Copper advanced November 10, 1 cent per pound, from 17 cents to 18 cents per pound, base.

Galvanized Ware.—Staple articles of Galvanized Ware, such as Pails, Tubs, &c., have for several months been selling at low prices, as a result of the competition of independent producers. While there has been no improvement lately, the tendency seems to be no longer toward a lower level and material advances in Spelter and improved general conditions have had a sentimental effect in steadying the market. It is well known that, at the present level of raw material, current prices on Galvanized Ware show but meager returns to the manufacturers, and some argue that the line would be unlikely to go lower even if there should be a moderate decline in Sheets. Many producers seem not to desire much business at the present level, merely taking the orders offered by their regular trade. With these considerations in mind, good buyers are keeping an eye on this market, and some are showing a disposition to purchase more freely than a while ago.

Stove Pipe and Elbows.—As we have already reported this fall, prices on Stove Pipe and Elbows are low and show considerable irregularity. Purchases, even on the part of the larger trade, have been in smaller quantities than usual, based upon immediate requirements. Recently there has been some increase in demand, due to the advancement of the season and to the improved general conditions. The situation may be reflected by the following quotations of a prominent manufacturer:

Nested Stove Pipe, Standard Gauge, Per 100 Joints.						
Inch.....	4	4½	5	5½	6	7
	\$5.66	6.24	6.46	7.03	7.30	8.00
Elbows, Per Dozen.						
Inch.	3	4	4½	5	5½	6
One-piece ...	\$0.51	.57	.63	.68	.74	.78
Four-piece....		.43	.45	.48	.51	.54

The above quotations are f.o.b. factory. A concession of 10 per cent. or thereabouts beyond these prices is obtainable by the larger trade.

Copper Products.—The demand for Copper products is more brisk and there is apparently a disposition on the part of buyers to cover themselves for wants for at least three or four months in some lines. In harmony with the advance in Copper Ingots there have been several additions of ¼ cent per pound to the base of bare Copper Wire for electrical purposes, in car loads, mill shipments, f.o.b., the base being 15¼ cents on November 6. Soldering Coppers, in lots of 300 lb. and over, are 18½ cents per pound base. There are also rumors of expected advances in Brass Material in the near future, as a consequence of the advance in Raw Copper.

Wire Screen Cloth.—Prices on Wire Screen Cloth for the coming season were announced the latter part of last week. They represent practically no change from the opening prices of a year ago, except on the Bronze variety, which has been reduced 50 cents per 100 sq. ft. Market conditions remain the same as before, leading makers acting in harmony, and the output of most of the smaller mills being sold through the same selling organization. One new factory has sprung up in the South, but the extent and grade of its probable production are not yet generally known. Following the plan now familiar to the trade, quotations made are only for deliveries prior to February 1. The manufacturers' prices to the retail trade on Wire Screen Cloth are as follows:

12-mesh, painted.....	\$1.30 per 100 sq. ft.
14-mesh, painted.....	1.90 per 100 sq. ft.
16-mesh, painted.....	2.25 per 100 sq. ft.
12-mesh, galvanized.....	1.90 per 100 sq. ft.
14-mesh, galvanized.....	2.20 per 100 sq. ft.
16-mesh, galvanized.....	2.55 per 100 sq. ft.
12-mesh, bronze.....	6.50 per 100 sq. ft.

The usual concessions in price are made to the large trade.

Spring Cotters.—A decided improvement has taken place in the market for Spring Cotters and Keys. Current quotations show advances ranging from 10 to 15 per cent., and it is said that manufacturers are unwilling to take large contracts even at the present prices. The market may be represented in a general way by a discount of 90 and 50 per cent., although this may be shaded somewhat by jobbers who have good stocks purchased before the advance.

Bright Wire Goods.—There is ground for again emphasizing the improved tone of the market for Bright Wire Goods, which in the matter of price have so many vicissitudes. It is said that outstanding contracts at low prices are pretty well closed up and that prices approximating 10 per cent. higher are quoted on new business. Retail merchants can obtain a discount of about 90 and 40 per cent.

Leather Belting, &c.—The market for Leather Belting, Lace Leather, &c., continues to exhibit a strong tone. Hides stay firm at practically the high point, and on equipment orders for Belting, manufacturers' quotations show a tendency upward. It is admitted that the advanced prices on Lace Leather have not been strictly maintained by all makers, a fact which may militate against a further advance, which some have expected to follow the conference of manufacturers scheduled for next week.

Jute Goods.—Handlers of Jute goods, including Wool Twines, Wrapping Twines, India Twines, Rope Packing, &c., continue to meet an advancing tendency in the market. Reports of a short crop of inferior quality have forced up the price of the raw material in London, and American manufacturers are said to be covering their requirements as far ahead as possible.

Chain.—The Chain market has again developed decided irregularity, affecting not only proof Coil Chain, but also Trace Chains, Cow Ties, &c. It would appear that manufacturers have not succeeded in the attempt to work in harmony, and are now acting independently. Prices on Coil Chain have fallen back to or below the level prevailing before the recent stiffening of the market, which may now be represented by a quotation on $\frac{3}{8}$ in. of \$3.25 to \$3.35 per 100 lb.

Window Glass.—The market is naturally growing weaker as a result of a larger output of Glass and comparatively light demand, the inevitable consequence of which would appear to be still lower prices. The present output is regarded as about one-third larger than the country is absorbing, and yet several additional factories have fire in and are said to be expecting to resume operations about the middle of the month. The committee is still working on the manufacturers' selling organization, which it is understood will be known as the Imperial Glass Company, if the required percentage of productive capacity can be induced to join the movement. Discounts of 90 and 30 per cent. for single strength and 90 and 40 per cent. for double strength Glass, from manufacturers' list, January 1, 1901, are obtainable from manufacturers, and possibly could be shaded in some cases. Minimum prices recommended by the Eastern Jobbers' Association from jobbers' list, October 1, 1903, are as follows: All sizes single and double strength Glass, covering territory east of Chicago, 90 and 20 per cent. discount. Local demand continues light, there being hardly enough business to test the stability of the market, but the above quotations could probably be shaded by the careful buyer for a fair sized order. Jobbers have been urged to hold the market firm in prospect of the formation of the Imperial Glass Company, when, it is expected, that the market would show more regularity and have a better tone.

Rope.—There has been no falling off in demand during the past week, nor does there appear to have been much increase, while orders are, for the most part, confined to moderate quantities. General quotations for Rope, 7-16 in. in diameter and larger, are as follows: Pure Manila, 9 cents; Pure Sisal, 7 cents. Mixed grades of both kinds grade down in price according to quality.

Jute Rope, $\frac{1}{4}$ -in. and up, No. 1, $5\frac{1}{4}$ to 6 cents; No. 2, $5\frac{1}{4}$ to $5\frac{1}{2}$ cents.

Linseed Oil.—There have been sharp advances in price during the week, following the 1-cent per gallon advance noticed in our report last week. The control of the Seed market appears to be in strong hands, and orders were placed for Oil in anticipation of the prospective advance by buyers who knew of it. Future developments will be awaited with interest. Since the 9th inst. demand has been moderate and confined to current requirements. Quotations for 5-barrel lots are as follows: State and Western Raw, 46 cents per gallon; City Raw, 46 cents per gallon. Boiled Oil is 1 cent advance on Raw.

Spirits Turpentine.—The market is stronger than at our last report, reflecting a firmer tone in the South. Local demand is fair, covering near-by requirements. The New York market is represented by the following quotations: Oil Barrels, $41\frac{1}{2}$ to 42 cents; Machine Made Barrels, 42 to $42\frac{1}{2}$ cents per gallon.

THE MEMPHIS CONVENTIONS.

NEXT week will witness the annual conventions of the American Hardware Manufacturers' Association and the National Hardware Association, which will be held simultaneously on the 18th, 19th, and 20th inst., at Memphis, Tenn. The headquarters of the associations will be at the Peabody and Gayoso Hotels, the manufacturers gathering at the former, and the jobbers at the latter. It is expected that the capacity of both houses will be severely taxed to accommodate the hundreds in the trade who will be in attendance at the meetings. Several parties have been made up to visit the conventions, the largest, of course, making the trip on the New York-Chicago special train, which leaves New York on Sunday morning, reaching the Windy City on Monday, and arriving in Memphis the following day. Interesting programmes of business and entertainment have been prepared, and those who visit the Southern city are pretty certain to enjoy the trip.

C. K. TURNER & SON, 116 Broad street, New York, export commission merchants, who represent a large number of American manufacturers in various lines, have completed arrangements, effective November 1, for handling the foreign trade of several new connections. They are now representing the Wayne Mfg. Company, St. Louis, Mo., making Washboards and Washing Machines, in Australasia, South and Central America, South Africa, Mexico, the Far East, India, Hawaiian and Philippine Islands and the West Indies. They will also cover identically the same territory for Wood, Smith & Co., Chicago Heights, Ill., in Vehicle Axles. Another connection for foreign trade is that of William A. Tottle & Co., 120-124 Hanover street, Baltimore, Md., who manufacture Brushes of various kinds, such as Paint, Varnish, Sweeping, Dusting and Artist Brushes. Still another recent business arrangement for the foreign trade is with the Sun Mfg. Company, Columbus, Ohio, which manufactures Showcases, Coffee Mills, Money Drawers and Woodenware specialties.

S. S. Groner, who for the past 30 years has conducted a general Hardware store and tin shop in Leetonia, Ohio, has lately purchased what is known as the Leetonia Store Company's Block, 60 x 110 ft. Mr. Groner occupies one of the storerooms of the block, a two-story building, 21 x 110 ft., and here he carries a full line of Shelf and Builders' Hardware, House Furnishing Goods, &c., with equipment for tin roofing, spouting and furnace work.

A. W. Luther of the firm of Luther & Jensen, Hardware merchants, Grantsburg, Wis., has sold his interest in the business to S. E. Jensen, by whom it will be continued as heretofore.

The stock of Philpott Hardware Company, Plano, Texas, has been slightly damaged by water as the result of a nearby fire.

The Continental Company.

IN a circular lately issued the Continental Company, Penobscot Building, Detroit, Mich., calls attention to the line of Screen Doors, Window Screens and Window Screen Frames which it is offering to the trade for the season of 1909. During the past year it is stated the company has employed a factory inspector who has visited each of the different factories regularly, carefully examining all the goods made, so as to keep the line thoroughly standardized as to quality, pattern and finish. As we have already noted, the company has lately concluded negotiations by which the Sherwood Metal Working Company, Syracuse, N. Y., manufacturer of metal frame adjustable Window Screens, has been consolidated with the other manufacturing concerns, whose combined product is sold through the Continental Company. Attention is also called to the company's facilities for prompt and economical service, not only to jobber, but to the jobber's customers, through the distribution car system of direct shipments, the company having nearly 350 distribution points. During the past few months the company has been conducting a general advertising campaign with a view to educating the people to the necessity of using Screens in order to protect themselves from the dangers of the fly. It has also prepared electrotypes for use by jobbers and retail merchants in catalogues, circulars or newspaper advertising, giving reports from various boards of health and short articles on the spread of diseases by the house fly. A large placard has also been prepared, printed in two colors, for hanging in the show window or other conspicuous place in the store, calling attention to the Continental Screens. The companies represented by the Continental Company have just issued their various catalogues of Screen Doors, Window Screens, &c. They include the Philadelphia Screen Mfg. Company, Philadelphia; Porter Screen Mfg. Company, Burlington, Vt.; Wabash Screen Door Company, Minneapolis, Minn., and Memphis, Tenn.; Owosso Mfg. Company, Owosso, Mich.; Queen Anne Screen Company, Burlington, Vt.; A. J. Phillips Company, Fenton, Mich., and Sherwood Metal Working Company, Syracuse, N. Y.

Retail Merchants' Mail Order Catalogues.

TO stimulate mail order buying on the part of its customers, the People's Hardware Company, Manistee, Mich., has issued a mail order catalogue consisting of 16 large pages in which seasonable Hardware, including Stoves and Ranges, Builders' Hardware, Roofing and General Hardware, are illustrated and priced. It is conspicuously stated on the front cover that the company guarantees "all goods shown in this catalogue to be strictly as represented and will cheerfully refund the purchase price on any article not found satisfactory." Goods, if in stock, will be shipped the same day order is received, and if not in stock the company will advise the customer at once as to when shipment can be made.

A mail order catalogue of entirely different character has been issued by the Spiro Hardware Company, Birmingham, Ala. It consists of nearly 50 pages, is well printed and is of pocket size, its dimensions being about 3¼ by 8¼ in. The catalogue is largely devoted to Stoves, Ranges and Heaters, but also illustrates Furnaces, Kitchen and House Furnishing Hardware. The company makes a specialty of Stoves and Ranges and states that they employ only skilled union mechanics and that every man sent out on a job is instructed "to do it right or not at all." The company carries in stock ready for prompt delivery repairs for a long list of Stoves and Ranges, and has connections through which it can obtain repairs for any Stove or Range made.

Henry Disston & Sons, Philadelphia, Pa., have opened a New York City branch office in the Vincent Building, 302 Broadway, where they will install a full and complete sample line of the Saws and other tools which they manufacture. The office will be under the management of H. C. Ellis, who will make it his business to co-operate with the local trade in every possible way in promoting the sale of Disston goods.

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Hardware Organizations.

New England Hardware Dealers' Association.

At a meeting on the 4th inst. of the Board of Directors of the New England Hardware Dealers' Association, Charles L. Underhill, Somerville, Mass., secretary, it was decided to hold the annual convention and Hardware exhibition at Springfield, Mass., on March 10 and 11 next. A bulletin giving full information in regard to the occasion will be mailed to the trade some time during January. At this meeting 20 applications for membership were favorably acted upon.

Ohio Hardware Association.

As already announced the next convention of the Ohio Hardware Association, Frank A. Bare, secretary, Mansfield, will be held at Columbus, February 23, 24 and 25 next. Some new and novel features in the business and social sessions will be introduced which, it is hoped, will add to the interest and pleasure of the gathering. A very large proportion of the membership of the association is expected to be in attendance, and the convention promises to be an exceptionally successful one. The exhibit of Hardware products by manufacturers and jobbers will be held in Memorial Hall, which is admirably suited to this purpose.

Pacific Federation of Hardware and Implement Associations.

The annual meeting of the Pacific Federation of Hardware and Implement Associations, T. M. Shearman, secretary, Monadnock Building, San Francisco, Cal., will be held in Spokane, Wash., probably on January 22 and 23, following the convention of the Inland Empire Association, which will be held in that city January 20 and 21. The Federation, together with the legislative committees of the various State associations embraced in it, are working to secure uniform legislation in the different States relative to chattel mortgages, collections, peddlers, trailers, liens and exemptions, and other matters of vital interest to the Hardware trade in the Pacific section of the country.

New York State Retail Hardware Association.

Louis J. Ernst, Rochester, chairman of the Convention and Exposition Committee and manager of the exposition, has sent out a circular letter under date, 3d inst., in which attention is called to the seventh annual convention of the New York State Retail Hardware Association, to be held at Rochester, February 16, 17, 18 and 19. A cordial invitation is given to manufacturers and jobbers to attend the meeting and also participate in the Hardware exposition, which will be held in conjunction with it. The headquarters of the association and all the business sessions of the convention will be at the Hotel Seneca, while the new Convention Hall has been secured for the exhibition.

Wisconsin Retail Hardware Association.

George W. Kornely, 806 Third street, Milwaukee, secretary Exhibit Committee, has issued a circular in which attention is invited to the thirteenth annual convention and Hardware show of the Wisconsin Retail Hardware Association, to be held February 3, 4 and 5, at the Public Service Building, Milwaukee. The circular gives the floor plan of the exhibition hall, indicating the amount of space in booths, nearly 100 in number, and the price charged by the association for exhibiting ranging from \$12 to \$25. The circular is accompanied by a contract form for space at the exposition.

The directors of the Hardware Dealers' Mutual Fire Insurance Company of Wisconsin, C. A. Peck, secretary, Berlin, held their fourth quarterly meeting on the 4th inst. A report was rendered showing that the insurance written during the past 10 months amounted to \$2,442,355, including new business aggregating \$945,365, with premiums of \$45,381.15. The losses paid during that period amounted to \$8962.24. The rebates from January to

October, inclusive, amounted to \$13,669.03. This statement shows that \$600,000 more insurance was written in the 10 months' period covered than during the entire 12 months of 1907. The directors were more than pleased with the condition of the company's affairs and determined to allow a rebate of 50 per cent. on all policies expiring in 1909.

Minnesota Retail Hardware Association.

As we have already noted, the thirteenth annual convention of the Minnesota Retail Hardware Association, M. S. Mathews, secretary, Minneapolis, will be held at the Armory, Minneapolis, February 23, 24, 25 and 26. In this connection also the second annual Hardware exposition is announced. The National Guard Armory, where the exposition will be held, has a main floor space of 25,000 sq. ft., with broad galleries on all sides of the building. Numerous requests for space at the exhibition have already been received, and with the steady growth in the membership of this large and influential organization it is believed that the attendance at the coming meeting will be larger than at any previous convention. The association is ready to furnish diagram of the exhibition hall, blank contract for space and any other information desired in regard to the exposition; 132 spaces are to be had at a cost ranging from \$10 to \$25.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

STEWART IRON WORKS COMPANY, Cincinnati, Ohio: Catalogue No. 35-B, relating to Iron Fences, including Adjustable Iron Foundation Bases, Three-Ribbed Channel Fence Rail, Line Posts, Picket Tops, Iron Fences for various uses, Gates, Fence Posts, Tree Guards, Vases, Park, Lawn and Cemetery Settees and Chairs, Stable Fixtures, Drinking Fountains, Architectural Ironwork, Railings, Guards, Jails, Prisons and Steel Cells.

J. R. DAWSON MFG. COMPANY, 1520-1524 North Palethorpe street, Philadelphia, Pa.: Illustrated catalogue No. 18, devoted to Household and Office Wire Goods. Among these are Easels, Plate, Cup and Saucer Hangers, Garment Hangers, Toilet and Bathroom Fixtures, Kitchen Utensils, &c.

HARDIE MFG. COMPANY, Hudson, Mich.: Catalogue of Power and Hand Sprayers, Spraying Tanks, Pumps, Nozzles and Sprayer Engines.

SILVER MFG. COMPANY, Salem, Ohio: Illustrated circular of the company's new model Clover Cutter, designed for cutting clover, alfalfa, vegetable tops, &c., into a fine palatable mass for poultry food in winter.

CLAYTON BROS., W. M. Bowes, sole agent, 127 Duane street, New York: Illustrated catalogue No. 6, showing an enlarged line of Steel Laid and Cast Shears, Scissors and Tinner's Snips.

GRAND RAPIDS REFRIGERATOR COMPANY, Grand Rapids, Mich.: Illustrated catalogue of Leonard Cleanable Refrigerators for 1909. A series of illustrations show the various steps in the preparation of the porcelain linings. The line shown includes in addition to porcelain, zinc and white enamel lined Refrigerators, Sideboard, Grocers' and Florists' Refrigerators, Ice Chests, &c.

SIMONDS MFG. COMPANY, Fitchburg, Mass.: Mailing card referring to the expectation of a post-election business spurt and announcing the company's preparedness for orders for Saws.

S. L. ALLEN & Co., Market and Eleventh streets, Philadelphia, Pa.: Catalogue for 1909, relating to Flexible Flyer Coasters and Planet, Jr., Farm and Garden Tools. New articles include Single and Double Wheel Disc Hoes, Horse Hoe, Cultivator, Furrower and Vine Turner, Beveled Cultivator Steels and Spring Trip Standards for Riding Cultivators. A view of the new five-story fireproof building, lately added to the company's plant, is given.

HARDWARE FREIGHTS.

Interstate Commerce Commission Complaints.

THE Hepburn law gives to the Interstate Commerce Commission the power to award reparation or damages to a shipper in any case where he has suffered a financial wrong or injury in matters growing out of "rates, fares and charges." The portion of the Hepburn law which grants and defines this power of the commission is the most important legislative act of Congress in regulating railroad traffic. It was a mere "incidental" feature of the law, but it may prove in its application the most useful piece of legislation of any kind that has ever been enacted in the United States.

Railroads Disposed to Yield Gracefully.

The railroads have shown a surprising disposition to yield gracefully to the decisions and orders of the commission. It has always been their policy to contest stubbornly the decisions of the courts, carrying appeals to the highest tribunals, and taking advantage of every technicality and delay of the law that may tire out any one who sues them, and when the Hepburn law was pending in Congress it was not generally favored by shippers because they had no faith in any remedy that would call for years of litigation and expense in every case that might be presented against a railroad company.

Few Appeals to the Courts.

The commission, however, has been so fair and painstaking in its consideration of all the complaints filed and impartial in its decisions that there have been very few appeals to the courts out of the thousands of complaints that have been decided. The "big" men in the railroad world have seen that it would not be good business policy for them to resist the orders of the commission, as it might promote more legislation. And besides the commission has drastic power to enforce its orders.

Not Necessary to Employ a Lawyer.

It is very important, therefore, that every shipper, whether manufacturer or merchant, should know the protection which the law affords. In 99 per cent. of the complaints filed with the commission it is not necessary to employ a lawyer. It is easier for the commission to consider and decide a case where the business man has simply presented the facts in a plain, straightforward manner than where a lawyer has ground up a library and thrown up a cloud of dust and technicalities to obscure the real merits of the case. Wherever possible

The Commission Prefers to Consider a Complaint "Informally," and every complaint should therefore be first presented in this manner. There are no costs to pay, no legal documents to be filled out and sworn, and no technicalities of any kind. The shipper merely writes a letter to Edward A. Moseley, the secretary of the commission, Washington, D. C., stating his complaint in ordinary business language, and accompanying the letter with any documents which substantiate his grievance. It is well for the shipper first to "introduce" himself, by explaining in a brief introductory paragraph in his letter the nature and extent of his business. In due time a reply will be received from the secretary, or from some member of the commission, or possibly from one of the auditors who conduct correspondence and investigate complaints.

It Rests with the Shipper to Say

whether the complaint shall be "informal" or "formal." In every case, therefore, it is very important in presenting a complaint to say that it is "informal." The law provides that the commission, if the claim appears well founded, shall transmit a copy of the shipper's statement to the railroad, giving it an opportunity to "satisfy" the complaint before any further proceedings. The railroad usually replies to the commission, and a copy of this reply is sent by the commission to the shipper. In thousands of cases that have been disposed of in the past two years a settlement has been reached by correspondence. In a large proportion of these cases the shippers were wrong or had no case, and the commission merely explained the law which disposed of the matter. In another large proportion of these cases some agent

of the railroad or some clerk in the claim department was wrong, and when the commission points out to the railroad officials the proper course the matter is settled promptly. This is an ideal method of settling disputes, and it is unfortunate that there is no tribunal to dispose of other commercial difficulties in the same informal and impartial manner.

"Formal" Hearings.

Complaints regarding rates can only be settled in this informal manner where the railroad consents to informal proceedings. Thus far the railroads have pursued a fair and businesslike policy by consenting to this informal "arbitration" in nearly 99 per cent. of the complaints that have been filed with the commission. The carrier, however, has a right under the law to demand a "formal" hearing, and this is done wherever the reasonableness of a regular rate is attacked by the shipper, or wherever an important question is involved which has not been already decided by the commission in "formal" cases.

A formal hearing is about the same as a lawsuit and requires the services of a lawyer. Legal experience in ordinary courts is not of much value in trying cases before the commission excepting in mere technical questions of procedure. There are, however, many lawyers throughout the country who are making a specialty of practice before the commission, and in the course of time they will become familiar with the theories and details of traffic questions and rates. Where the amount involved is small it will not pay the ordinary shipper to pursue a formal hearing. The chief cases of this character involve important questions of rates and are usually prosecuted by associations of shippers.

The commission has followed successfully a plan which increases its efficiency in hearing cases. One member of the commission can hear the evidence and the arguments and the printed record is then considered before the full commission at Washington before the decision is announced. Examiners in the employ of the commission also conduct these hearings. This enables the commission to cover the country by holding its hearings in all the leading cities, so that any case can be tried wherever it is most convenient for the shippers and railroad people to meet with their witnesses.

Questions the Commission Can Decide.

The law does not give the Interstate Commerce Commission any authority or jurisdiction to enforce the payment of claims for loss or damage to freight or for delay in transit, or claims for any commercial wrong like wrongful delivery or mistakes or negligence which result in financial loss or injury to the shipper. The commission can do nothing to help any shipper in individual cases of this character. If the railroad will not settle the only recourse is to sue in the ordinary State or Federal court just as though there were no interstate commerce law or commission.

The jurisdiction of the commission is limited to questions regarding "rates, fares and changes," and the "regulations or practices" of the railroads engaged in interstate commerce. On these questions the commission has broad and drastic powers, wherever interstate commerce is involved, but it can seldom take any action where the shipment involved did not cross State lines. It is important to draw the line and spare the commission useless correspondence and investigation, as it can do nothing excepting along the lines defined by Congress in the law.

Translating Tariffs.

If a shipper has been charged more than the legal tariff rate and the claim agent will not refund the money a complaint to the commission will bring results without a "formal" hearing. In these cases there is usually a dispute between the shipper and the employees of the railroad regarding the meaning or application of the tariff. The members of the commission are with one exception lawyers, and they have become experts in translating tariffs, and they also have a staff of auditors who are gaining experience in this line. When a complaint of this kind is presented they decide what the tariff means or how it should be applied, and this is usually all that is necessary. The shipper in writing the commission should

send the expense bill and any other documents that will help to show the facts, and should also quote the I. C. C. number and date of the tariff, and the name of the road issuing it. The commission has complete files of all tariffs, and the I. C. C. number and date are necessary in making a complaint, so the auditor who looks it up can verify the tariff.

Mistakes in Tariff Make Trouble.

In many cases a railroad will acknowledge that it has overcharged the shipper, or that it charged an unreasonable amount, but will claim that it was compelled to do so because the tariff in effect so provided. The law compels a railroad to enforce its tariff, no matter how unjust or unreasonable it may be in a particular case. The men who compile tariffs make mistakes like other mortals, and a tariff provision often strikes in an unexpected place and makes trouble. The railroad can do nothing in a private settlement through the claim department, but the commission can authorize a settlement if the shipper will file an "informal" complaint. Thousands of cases of this character have been settled since the passage of the Hepburn law. In fact, a large proportion of the informal cases before the commission grow out of these accidents and mistakes in tariffs.

Commission Can Go Back Two Years.

The commission has the power to go back two years from the date a complaint is filed in ordering reparation. This power covers any case where the amount paid was technically the legal rate, but for any reason was excessive or unreasonable. If the complaint is against a regular tariff and not merely on account of a mistake or unexpected application of a rate, the railroad usually resists the complaint and demands a "formal" hearing; but in most cases there has been a mistake and the matter can be settled by an informal complaint. In such cases the commission requires that the railroad shall file a new tariff correcting the mistake, within six months after the trouble occurred, or it will not act upon an informal complaint.

Misrouted Shipments.

For a time after the Hepburn law went into effect, the commission held that if a shipment had been misrouted or if it went astray, the consignee must pay the legal rate for all the distance that it traveled, and then file a claim with the commission if he wished to recover the overcharge. This rule, however, has been changed. The railroad should not now collect any more than the legal rate the shipment should have paid if there had been no mistake. On shipments that have moved since March 18, 1907, the railroad can settle without any action by the commission, if it has collected any overcharge on "misrouted" shipments. When there is an overcharge of this kind, it is better for the consignee to refuse the shipment until it is corrected. Occasionally, however, the consignee is in a hurry for the goods and the railroad agent takes advantage of him. Most railroads allow their local agents to refund overcharges within the month, and where the money has been paid to the agent he can, therefore, refund before his account for the month is closed. If, however, it is necessary to go to the claim department on a misrouted shipment, there should be no trouble about it, as the law permits a prompt settlement.

On long distance shipments, which pass over several connecting roads, it is the duty of the initial carrier to route freight via the intermediate line which has the lowest legal rate in effect. If a shipment is sent over a route which has a higher tariff, the initial road or the one responsible for the error is required by rulings of the commission to refund the overcharge caused by its mistake. The commission has ruled that the roads cannot prorate or divide the amount to be refunded.

CORRESPONDENCE.

Original Bill of Lading Should Be Sent with Invoice.

To the Editor: In behalf of the Hardware jobbers far removed from market I want to make an appeal through

your estimable journal to the manufacturers and all others who ship us goods. The favor I ask is very reasonable, in fact, is our right, and should not be characterized as a favor. It is that we be furnished with the original bill of lading for the shipment at the same time we are furnished with the invoice. Those who have not experienced the great inconvenience we undergo cannot imagine how annoying it is for one to attempt to verify a freight charge when he has no information as to point of origin.

Shipments Not Always Sent from Point Where Office Is Located.

All manufacturers and sellers of Hardware do not make shipment from the point where their office is located, but frequently from some point in another State. The shipment reaches consignee with certain charges assessed that have the appearance of being and frequently are excessive, but he can have no relief until he has written for the original bill of lading. Meanwhile, he must pay the excessive charge, and later file claim for overcharge, whereas if he had the bill of lading in the first instance he could have had correction made.

Consignee Is Entitled to O. B. L. as Evidence.

I take the ground that the consignee is entitled to the original bill of lading as an evidence that shipment has been made. An unsigned dray ticket is worthless, as are duplicate bills of lading. No well organized house will pay its freight bills until they have been verified with the tariff under which the shipment moved, and to do so intelligently the point of origin is very necessary. There are carload rates, less than car rates, class rates and commodity rates. They apply from some points and from some they do not apply. The original bill of lading should be at hand, because there can be and frequently is loss from overcharge, loss and damage, all or one.

W. W. WEBBER,

FORT SMITH, ARK.

A Manufacturer's Method.

To the Editor: Your articles on "Hardware Freights" are very interesting. As manufacturers we buy all our goods delivered, so that we do not need to watch our in freights more than to see that the proper amount is deducted from invoices.

On our freights we deliver much of our product. As we sell but one article it is an easy matter to keep track of rates to all points. We deduct freight from our invoices and it is up to the purchaser to see that we deduct the correct amount. If the railroad charges any more, he sends us the expense bill for credit of the excess, whereupon we present to the railroad the expense bill with our bill for refund.

We keep a ledger account with each railroad and make it a business to watch the accounts and see they are paid with a fair degree of promptness. It is seldom we have to make complaint of treatment received from any railroad. As a rule they seem desirous of giving us the advantage of every doubt.

ILLINOIS.

TO ADVANCE the interests of the gas industry of the United States the National Commercial Gas Association will, in connection with its annual convention at Chicago, December 8, 9 and 10, hold an extensive exhibition of gas appliances, in which the American Gas Institute cooperates. The Gas Appliance Exposition will be held in the First Regiment Armory during the entire week, beginning December 7. Particulars regarding the exposition, exhibits, space, &c., can be obtained from John C. D. Clark, chairman Committee of Arrangements, 157 Michigan avenue, Chicago.

THE HARDIE MFG. COMPANY, Hudson, Mich., has largely increased its stock, and will devote the additional capital to the erection of new buildings, thus increasing the capacity. During the coming year particular attention will be paid to the manufacture of power Sprayers, for which the demand is increasing rapidly. The company has started a branch of its business in Portland, Ore.

Here and There in the Hardware Store.

BY SAMUEL MASTERS.

VIII.—EXTENDING THE FIELD FOR SOLICITATION.

WHEN Mr. Clark, Hartman Brothers' credit man, had checked through the first 300 record cards I submitted to him, I found that a little over 200 were approved for solicitation, and I had finished only the list of names beginning with A. Mr. Martin, the city sales manager, had not seen the cards, and when I took to him the 200 approvals, filled with self-approbation to think I had got such a goodly lot of prospective customers to work with, I was surprised to note that he did not share my pleasure. He had confined his solicitation work to a few large concerns, with the idea that the credit man would not accept smaller accounts, and this sudden thrusting upon him of the responsibility for trade with this list of firms was not at all to his liking.

Refused to Be Convinced.

"This is all poppycock," said he. "I don't know what Clark means by O. K.'ing cards for solicitation when he won't pass the orders. What is the use of going after business and then having it turned down?"

I told him that I thought that Mr. Clark would be slow to turn down an order if he had initialed the card.

"No, he won't," said Mr. Martin. "It won't make a bit of difference. When the orders come in he will get his suspicions going and N. G. them all. You let me have the cards for a while. I want to look them over."

Later in the day I went into Mr. Clark's office, but beat a hasty retreat when I found Mr. Martin there with my bunch of cards and the two engaged in a heated discussion. Still later I saw Mr. Martin assorting the cards into little piles and looking them over carefully, and when his two city salesmen came in at about 4 o'clock, the three men went with the cards into a little corner office and were still there when the day closed.

Testing the Credit Rulings.

The next morning, just before noon, one of the salesmen appeared and called for his order book. He wrote in it for a few minutes and showed the book to Mr. Martin, who gave it to a boy and sent him with it to Mr. Clark. When he returned there was an excited conference for a few minutes. Later the other salesman appeared and the performance was repeated, and for the next day or two there were sundry repetitions of the discussions of Mr. Clark's rulings.

When I took the next bunch of cards—the B's—to Mr. Clark he said:

"Well, Sam, you're waking them up, I see."

"Waking who up?" I asked.

"The city salesmen. Have you seen the orders they have been bringing in?"

I told him I had not, and he then informed me that he had had a dozen orders to approve from new firms, and that they had all been among the smallest on the list. It was evident that some experimenting was being done to determine whether Mr. Clark's conditional approval meant anything, and it was found that the approval counted.

Completing the List.

In a few days the B cards were given Mr. Martin, who was eager to get them, and looked them through with his salesmen as before. Other bunches followed in rapid succession, and in about a month some 2500 cards had been inspected and about 1600 approved. The first step in the reorganization of the sales methods had been taken.

The Blue Book Distributed.

By this time the Blue Book was finished and I began to send it out. Mr. Martin had said that he wanted his city salesmen to deliver the books to their own customers, and I asked the men for the names, so that I might avoid sending duplicates. I soon found, however, that the men did not wish to hand out the books, and one of them declined with profane emphasis to do so.

Upon Mr. Martin's insisting that he do as requested he gave me a list of 12 names, and took 12 books with the ostensible purpose of delivering them. I found them in his desk later and mailed them to the 12 men to whom they should have gone. I think the other man delivered his quota.

Increased Sales.

It took me a week to get the Blue Books distributed, and before the last were mailed a very perceptible increase in orders was felt. Mr. Martin, who assumed the credit for its issuance, was filled with gratification, and told Hartman, Jr., that it was the best thing that had been done to boom trade. All the clerks had their stories to tell of new trade developed by this means, and within a very short time the book was declared to have paid for itself. This, of course, pleased every one—Mr. Martin, who thought he had created the book; Hartman, Jr., who knew he had given the final impetus to its formation, and I, who had done the work.

Daily Reports.

As soon as I had finished with the Blue Book I was ready for the next step in the trade expansion movement. It seemed to me that the two city salesmen spent entirely too much time in idleness, and I felt sure that when they were outside their time was not all devoted to Hartman Brothers' work. In order to determine this and that I might have a record of calls to transfer to my record cards, I devised a daily report, which was made of the proper size to slip into a No. 6½ envelope, if necessary.

A Change in the Force.

I found that Mr. Martin was very willing to put the report into effect. He had been trying to get his men awake to the necessity for greater effort to meet the criticism that was caused by decreased sales. They sulked instead of working, however, and Mr. Martin soon became aware that some of the blame for the unsatisfactory condition lay with his aids. He showed the report form to the men and asked them to fill it out, but considerable argument ensued before they would agree to do so. Only one of the men turned in his reports. The other failed to do so, and upon Mr. Martin's insisting that he fall into line he became abusive and was discharged. His place was filled by the house man who had handled his orders, a slim, wiry young man, with an appetite for work, who was highly gratified at the promotion and anxious to give satisfaction in his new position.

(To be continued.)

A New Tennessee Jobbing House.

THE Hardware business of W. A. Hutton & Co., Galatin, Texas, has been sold to C. A. Whiteside and E. P. Dickerson. Mr. Hutton is moving to Nashville, Tenn., and forming the firm of McWhorter, Hutton & Co., which will engage in the jobbing business exclusively, handling Hardware and kindred lines. Mr. McWhorter has been vice-president of the Montgomery, Moore Mfg. Company. The other member of the firm is W. C. Weaver, who has been connected with J. H. Fall & Co., Nashville. The new firm has secured a desirable location at 336 Public Square, Nashville, and will be pleased to receive catalogues, price-lists, &c., from manufacturers.

HIBBARD, SPENCER, BARTLETT & Co., Chicago, are now mailing to the trade lot No. 14 of extra catalogue pages for insertion in their loose leaf catalogue. About 500 new pages are included in the lot, which is intended to bring the catalogue up to date. Obsolete lists, styles and patterns of goods are thus eliminated, making it possible to keep the catalogue up to date without its growing to unwieldy size through the retention of obsolete matter. Because of the reduction in size of electrotypes and their judicious arrangement the 500 new pages sent out will replace about 650 pages now in the catalogue, at the same time the matter descriptive of the various articles shown will be increased rather than diminished. These extra pages are being sent out in a large envelope, which holds them flat without folding.

Holiday Trade in the Hardware Store.

Artistic Holiday Windows.

THE Churchill Hardware Company, Galesburg, Ill., has more than a local reputation for the beauty and originality of its window displays. It has 10 ft. windows on either side of its entrance, and considers them the best advertising medium that it has. The results which they bring are especially emphasized at Christmas time,



Hibbard, Spencer, Bartlett & Co.'s Holiday Advertising.

An advertising circular designed for distribution by retail merchants to their customers, for the purpose of stimulating trade in special lines of holiday goods, has been prepared and is being offered to customers by Hibbard, Spencer, Bartlett & Co., Chicago. The circular is entitled "Christmas Suggestions," and is printed on a 12 x 18 in. sheet, which is so arranged as to fold in convenient form for addressing without an envelope, and



Holiday Windows of Churchill Hardware Company.

since invariably the goods shown in the window are the ones which sell most freely during the holiday season. Some years it has been Nickel-plated Ware, and there has been a big sale of that line of goods; another year it was Sporting Goods, and they took the lead; the next time one window was filled with Lamps and more were sold that Christmas season than the firm ever sold in a year before.

Variety vs. Emphasis.

For these reasons the company usually tries to show in its windows as large a variety as possible, although this makes it harder to get a good effect than when a single line is used. At the same time, the fact should not be lost sight of that emphasis placed on individual lines and large sales during the holiday season are likely to lead to an increased business all the year round in these lines.

The accompanying illustrations show the windows which the company dressed the week before Christmas last year. The general effect of these windows was exceptionally beautiful, the background being composed of orange leaves and pepper tree blossoms from California. Evergreen strings were also interwoven with the blossoms. Just above the wainscoting in one window a cozy corner was made with pillows of the neighboring colleges and various university pennants. The corner was occupied by two Teddy bears and the balance of the window was tastefully dressed with fancy ware, such as Chafing Dishes, Coffee Machines, Nickel and Copper Ware, &c.

The other window had the same background and general effect, but had a tree in the center on which were perched Teddy bears in all sorts of attitudes, some hanging by their toes on the limbs, one hanging by one hand, one sitting in a swing swinging, and four gathered around a table under the tree eating. This window was filled with fine Cutlery, Fancy Bronze Goods, Smokers' sets, &c.

CHRISTMAS SUGGESTIONS

We have a large variety of items desirable as presents but have selected those shown as being particularly useful and good value

SAFES AND COATERS No. 100 \$10.00 No. 101 \$15.00 No. 102 \$20.00 No. 103 \$25.00 No. 104 \$30.00 No. 105 \$35.00 No. 106 \$40.00 No. 107 \$45.00 No. 108 \$50.00 No. 109 \$55.00 No. 110 \$60.00 No. 111 \$65.00 No. 112 \$70.00 No. 113 \$75.00 No. 114 \$80.00 No. 115 \$85.00 No. 116 \$90.00 No. 117 \$95.00 No. 118 \$100.00 No. 119 \$105.00 No. 120 \$110.00 No. 121 \$115.00 No. 122 \$120.00 No. 123 \$125.00 No. 124 \$130.00 No. 125 \$135.00 No. 126 \$140.00 No. 127 \$145.00 No. 128 \$150.00 No. 129 \$155.00 No. 130 \$160.00 No. 131 \$165.00 No. 132 \$170.00 No. 133 \$175.00 No. 134 \$180.00 No. 135 \$185.00 No. 136 \$190.00 No. 137 \$195.00 No. 138 \$200.00 No. 139 \$205.00 No. 140 \$210.00 No. 141 \$215.00 No. 142 \$220.00 No. 143 \$225.00 No. 144 \$230.00 No. 145 \$235.00 No. 146 \$240.00 No. 147 \$245.00 No. 148 \$250.00 No. 149 \$255.00 No. 150 \$260.00 No. 151 \$265.00 No. 152 \$270.00 No. 153 \$275.00 No. 154 \$280.00 No. 155 \$285.00 No. 156 \$290.00 No. 157 \$295.00 No. 158 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is illuminated with a holly border and title in red and green. Fig. 1 is a reduced reproduction of the inside page, which carries 16 advertisements, comprising an

SLEDS AND COASTERS.



No. B108 90c

Size 20x12 in., with 3 bent knees braced with 6 steel braces, varnished, and top nicely painted, and decorated, oval steel runners, a well made, serviceable sled.



No. B18 \$1.50

Size 42x12 in., polished maple, top painted in two colors, painted and decorated by hand. The sides are braced with 4 angle irons. The runners are plain round spring steel, scrolled and tinned. There are 4 hand holes. This is a large fine sled, extra well made.

Fig. 2.—Single Advertisement from Circular.

COME TO US

FOR USEFUL, PRACTICAL, DURABLE
SENSIBLE HOLIDAY PRESENTS.

We carry a large variety of articles
suitable for Gifts. Here are a few:—

ONE
CENT
STAMP

LOOK FOR THIS BRAND

AND REMEMBER THAT

OUR VERY BEST is the VERY BEST

Fig. 3.—Front Cover of Christmas Circular.

assortment of articles suitable for holiday trade, all made up in uniform size about $2\frac{1}{2} \times 3$ in. One of the individual ads. is reproduced separately in Fig. 2. A definite list of articles is furnished from which choice can be made to comprise

A Selective Assortment,

composed of any group of 16 required for the sheet. This allows the merchant wide latitude of choice and makes it possible to include only those that are suitable

Christmas Suggestions

ONE
CENT
STAMP

41 Clark St.
Bronton, Ky.

Fig. 4.—Circular as Folded and Addressed for Mailing.

for his purpose, the line of goods comprising the selection having been prepared with the idea of general adaptability to various retail stocks. The articles included are such as are carried by the majority of Hardwaremen. The retail price of each article is printed in plain type, and is figured on a basis that affords a fair margin of profit; these prices are fixed and not subject to alteration. At the bottom of the inside page of the circular a space is provided in which to print the customer's name, town, street and number.

The reverse or address side of the sheet is divided into two parts, one being devoted to the display of a half-tone illustration of Silverware, Pocket Knives and Carvers for all of which retail prices are given. The other half of the reverse side forms the front cover, Fig. 3, and carries prominent display lines calling attention to other suitable gift goods not illustrated. When folded for mailing and addressed it presents a neat appearance, as indicated by Fig. 4. The circulars are printed the same day orders are received, and are furnished free of charge with an order for the goods advertised in the 16 spaces. They are bright and attractive in appearance, and include a sufficiently large assortment to appeal successfully to each member of the home to which they are sent. It is believed that these circulars win better attention if mailed than when distributed by other means, and they are only furnished with this understanding.

SUGGESTION FOR GUN AND AMMUNITION WINDOW.

AT this season of the year Hardware merchants who handle Guns and Sporting Goods usually wish to make a window display of Guns, Ammunition and hunters' supplies. Ingenious window dressers will doubtless have good original ideas to work out in this connection, but one or two suggestions of a practical nature may not be unwelcome, especially to those who are too busy to give these matters the attention which they deserve.

In a recent issue of *The Iron Age* was described an effective window scene, designed by H. D. Thompson & Co., Malone, N. Y. It represented a hunter's camp in the Adirondacks, and, although not unduly complicated or difficult to construct, was so cleverly arranged as to present an illusion calculated to please and hold the attention of any observer, especially one with a taste for shooting and a love for outdoor life.

A Duck Hunting Window.

A natural duck hunting scene may be prepared without much difficulty in the following manner: Dress the floor of the window to represent marshy ground or the shore of a river, lake or bay. A bit of water may be suggested by a piece of looking glass, either near the middle of the floor or in the background. The balance of the floor should be strewn with dry grass, moss, &c., and the sides filled in with clumps of rushes and cat-o'-nine-tails.

At one side of the window, partially concealed among the rushes, place the figure of the duck hunter. A dummy man may be dressed up in hunting coat, old trousers tucked in rubber boots, leggins or high leather shoes, slouch hat, &c. For the head, a wax head, if obtainable, is, of course, the most lifelike, but otherwise, some substitute can be devised, possibly by shaping a stuffed head and painting a face on it or putting on a false face such as is obtainable in toy shops.

The hunter's Gun should be at his shoulder. It may be suspended in the proper position by wires and the arms of the figure fastened in the right places to aim the Gun. The game may be a flock of stuffed ducks hung in the upper part of the window in the background, with light blue cheese cloth stretched behind them to represent sky. For advertising purposes a few other Guns, with Ammunition, Game Bags and Sportsmen's Supplies and one or two signs may be included in the window, but they should be subordinated to the general effect.

Adapted to Deer Hunting.

This idea may be used with equally good effect in getting up a deer hunting scene. Of course the back-

ground should be changed to woods, which may be represented by young evergreen trees and leafy branches. A stuffed deer head may be skillfully arranged so that the animal will seem to be emerging from a thicket, and the figure of the hunter may be placed at one side with Gun at shoulder ready to shoot.

Hardware Window Dressing.

"HARDWARE WINDOW DRESSING" is a book of 256 pages, 8 x 11 in. in size. It is substantially bound in dark colored cloth, printed on heavy coated paper and contains over 200 illustrations relating to this subject, ranging from small diagrams of fixtures, window furniture, &c., to full page plates of double window displays and store fronts. All of the diagrams are accompanied by working descriptions with the aid of which a merchant could duplicate the devices illustrated or easily adapt them to his own use. Most of the complete displays illustrated are described in considerable detail. Special attention is devoted to general suggestion, seasonable displays, window construction, decorative effects, such as backgrounds, draping and festooning, harmony of colors, &c. The book is compiled and edited by Thomas A. Bird and published by the Merchants' Record Company, Chicago.

A Double Barreled Single Trigger 20-Gauge Gun.

The Hunter Arms Company, Fulton, N. Y., has put on the market a new double-barreled single trigger 20-gauge L. C. Smith Shotgun, described as perfect in balance and correct in its lines, and weighing $5\frac{1}{4}$ to 6 lb. It will be made in No. 0 and better grades, with barrels 24, 26, 28, 30 and 32 in. in length. Stocks are standard length and drop, and the gun is supplied with or without automatic ejector, and is so constructed that the Hunter one-trigger can be fitted to it. The company emphasizes the fact that the gun is not a 16-gauge frame cut down, but that it is correctly made from the foundation stock, lock and barrels.

Quride Silent Gears.

The Plerome Hide Company, 1417-1419 North Salina street, Syracuse, N. Y., has appointed Bettes & Ebsen, 62 Reade street, New York, sole New York agents for the sale of a new material known as Quride, used largely in the manufacture of gears. Quride is produced by treating hides by a patented chemical process, which changes the albuminoids to fibroids. This change, which practically extracts the animal matter, compresses the remaining fiber and fills the pores, renders the hide insoluble and reduces it to a tough, hard, noiseless substance. This material, for use in silent running gears, is said to be nonabsorbent, not affected by oil, grease or moisture and is not injured by ordinary temperatures where gears are used. Gears made of Quride are especially suited for use on printing presses, folding machines, geared power pumps, blowers, automobiles and especially for high speed machinery. A 12-page booklet just issued by the company gives full particulars.

Electrically Welded Trace Chains.

The Standard Chain Company has just completed a large fireproof building at York, Pa., in which it is installing its electric welding department. The building is 80 x 224 ft., and of steel construction. The company has been working in a modest way with electric welding for the past four years and is now manufacturing by this process not only German machine chain, but a line of trace chains, these trace chains being formed by automatic machinery and each link being absolutely uniform in size. They are all carefully examined, proof tested, and are sold with a guarantee as to quality. We understand this company has recently issued new and re-

duced prices, and we are told a large number of jobbers are now carrying these goods in stock in preference to the chains made by the ordinary process. The machinery used in their manufacture is patented, and in some cases under patents applied for. One special merit of this chain is that there is no swell at the weld, but the link is of absolutely uniform dimensions in all parts. These trace chains are being made in three sizes, light, medium and heavy; consequently a stock of six barrels, one of each in $6\frac{1}{2}$ ft. as well as 7 ft., will give the entire variety and constitute a complete stock, whereas in the ordinary welded goods some 30 or 40 different sizes are carried in stock, thereby necessitating the jobber carrying a much larger assortment and having a heavier investment in proportion to the value of the goods sold.

The Erie Design Inside Lock Set.

The Taylor & Boggis Foundry Company, Cleveland, Ohio, is offering the inside lock set herewith illustrated, made of cast iron only and furnished in all finishes. The



The Erie Design Inside Lock Set.

company also furnishes this design in front door, sliding door and mortise latch sets, in push plates, push buttons and flush sash lifts.

The A & J Egg Beater and Cream Whip.

The accompanying illustration represents a beater and whip put on the market by A. & J. Mfg. Company, 50 Leroy street, Binghamton, N. Y. In the hard wood handle is a coil spring, and the wings are made of twisted wire. The nickel plated steel ferrule has a clover leaf hole in it and forces the wings to make six revolutions to each downward stroke of the handle. The beater is operated with one hand, with a short up and down stroke of the handle, and special claims are made for the rapidity and efficiency of its work. It is explained that the device has strength to beat any number of eggs or any ingredient in any quantity and that it is so constructed that it will beat the white of a single egg. The device is recommended for mixing mayonnaise dressing, and leaves one hand free to add ingredients.



*The A. & J.
Egg Beater
and Cream
Whip.*

THE YALE & TOWNE MFG. COMPANY, 9 Murray street, New York, has recently displayed in its show window a No. 853 $\frac{1}{2}$ Yale Padlock, which has seen over eight years of service and is still in good condition. The Lock has been used on the oil house of the St. Paul & Tacoma Lumber Company, Tacoma, Wash., and a letter from this concern is shown with the Lock, stating that it has been operated upward of 50,000 times.

Angler's Select Assortment No. 1154.

The accompanying illustration represents an angler's assortment, offered by the E. A. Pfeuger Company, Akron, Ohio. The assortment comprises necessary articles for casting, trolling and still fishing, and suitable for black bass, pike, pickerel and other game fish. The as-



Angler's Select Assortment No. 1154.

sortment includes the company's most popular lures in finest quality, put up in fancy hinge cover partitioned display box, and is intended to retail for \$2.50 per box, complete. At usual retail prices the various articles would bring \$3.25. The assortment is made up of one each wooden minnow blended rainbow, double propeller glow spinner, weedless casting spoon, Carlton spinner, original casting spinner nickel convex, original casting spinner white enamel, Hercules cable wire leader, half dozen each of three different kinds of snelled hooks, half dozen connecting links and half dozen casting swivel sinkers.

Gem Golf Ground Cup Hole Cutter and Plate.

The golf course requirements shown in the accompanying illustrations are manufactured by the Gem Mfg. Company, Pittsburgh, Pa. Fig. 1 shows the cup itself and Fig. 2 the hole cutter and ground plate used in placing the cup in position. As all golf players are aware, a true straight edge hole is necessary for well kept links, and also for good golf playing, and the articles referred to have been designed to supply these requirements. The cylindrical portion of the cup is made of heavy gauge brass tubing; therefore it is not subjected to corrosion like steel or other metals, but will last indefinitely, and it is said does not damage the



Fig. 1.—Gem Golf Ground Cup.

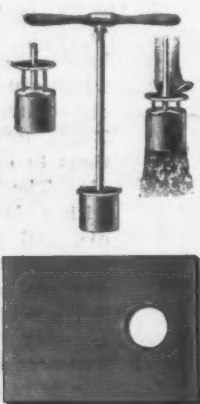


Fig. 2.—Hole Cutter and Plate.

greens in changing the location of the hole. The base of the cup is made from a machined casting, and is slightly smaller than the cylinder portion, being provided with a small tube securely screwed into the bottom, which acts as a drain for the cup, and also as a support for the flagstaff. The plate shown in Fig. 2 is for use with the hole cutter. When a hole is to be cut the operator sets the plate immediately over the desired spot, and then forces the cutter into the ground through the hole in the plate. When the cutter is withdrawn the weight of the operator standing on the plate prevents the turf from

breaking around the hole. The plate may also be used when withdrawing the cups, if desired, and the company furnishes with each set of cups a tool for pulling them out of the ground.

The Glow Light.

The Glow light shown herewith is put on the market by the Glow Light Company, 73-75 Pearl street, Boston, Mass. It burns kerosene gas, but without either compression or gas storage. The vaporizing

is automatic and instantaneous, and takes place in the burner, Fig. 1, which is made entirely of glass, all in one piece. At the top is a bulb, about 1 in. in diameter; below a tube, the lower end of which should always be submerged in the oil. A small round wick passes up through this tube and through the center of the bulb to a small circular opening in the top of the bulb. This wick should never extend above the burner, but should be adjusted so that the upper end is just even with the top of the burner. When the wick takes fire the flame completely seals the opening through which the wick passes. The heat immediately vaporizes the oil in the wick inside the bulb, and the vapor or gas thus formed is consumed at the top of the wick, burning with a clear steady flame. The company explains that the vaporizing of the oil is automatic and constant so long as the oil covers the lower



Fig. 1.—Burner Glow Light.

end of the tube, and that vapor in excess of that required to feed the flame condenses and flows back down the tube, thus insuring perfect combustion. It is also stated that the lamps do not smoke if the wick is properly adjusted, and that they do not consume the oxygen in the air. The statement is made as the result of tests that a single cent's worth of kerosene oil will burn nearly 200 hr. Glow lights are intended to be used when a soft low light is wanted, but are not designed to read or work by. They are said to make a perfect light for bath or toilet

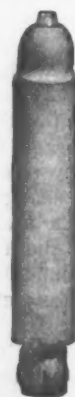


Fig. 2.—Glow Candle.



Fig. 3.—Glow Colonial Candlestick.



Fig. 4.—Glow Combination Lamp.

room, bedroom, hall or stairway, and are especially recommended for sick rooms, because they consume no appreciable amount of oxygen. In candle form, Figs. 2 and 3, they are attractive, economical and convenient for table or room decoration. Glow candles are made to fit any candelabra or candlestick, and in appearance are said to resemble a wax candle so closely as to deceive the eye. Fig. 4 shows a combination Glow lamp, which is made entirely of brass, and stands with globe 6 in. high. It may be quickly lifted from the wall fixture and carried from room to room or placed upon a stand or table. It will burn all night long for nearly a week with one filling. Each lamp is packed separately in a strong pasteboard box complete with globe, burner and a brass hook for attaching the fixture to the wall. Illustrated booklets showing many styles of Glow lamps and candles will be sent by the company on application. Wicks, burners and globes are furnished separately as desired.

The Luther Hand Grinder.

The Luther Bros. Company, Milwaukee, Wis., has added another hand grinder to its already extensive line of such tools. The new machine which is here illustrated

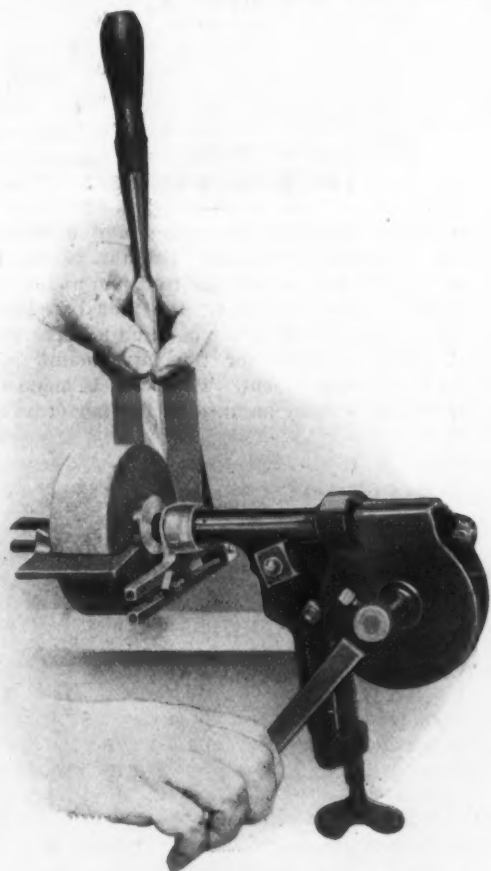


Fig. 1.—The Luther Hand Grinder.

is so constructed to permit the grinding wheels to be adjusted to any position desired. The grinding wheel is mounted on a spindle supported by bearings attached to a bench clamp. The wheel may be set to run in a vertical or horizontal position as exigencies of the work demand, and is easily changed from one position to another.

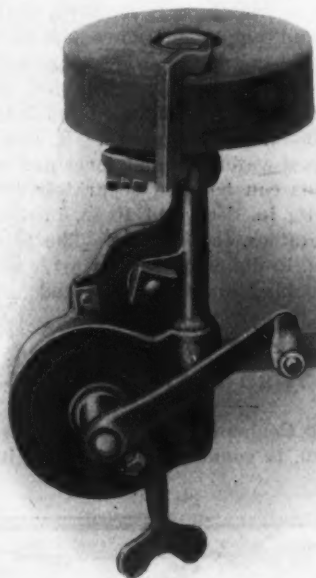


Fig. 2.—Luther Grinder in Upright Position.

The wheel is driven by a worm gear cut in brass from the solid blank, and is fully protected from dust by a tight casing. Wear on the machine is further lessened by running the working parts in oil, which also contributes to its noiseless operation. Its accuracy and easy motion are enhanced by the ball bearings on which it

runs. When used in the upright position the grinder is specially adapted to the sharpening of knives, plates, hair clippers, or other large flat blades. It is especially serviceable in grinding harness knives, and its easy adjustability to any position makes it a great convenience to any user of edged tools. A chisel and plane bit guide shown in Fig. 1 to facilitate the accurate grinding of these tools is furnished with each grinder. In addition to the use of this machine as a grinding tool it is designed for use, as shown in Fig. 3, in connection with a Babcock milk tester. With the wheel removed and the spindle in perpendicular position, the tester can be conveniently attached and the tool made to do double service.

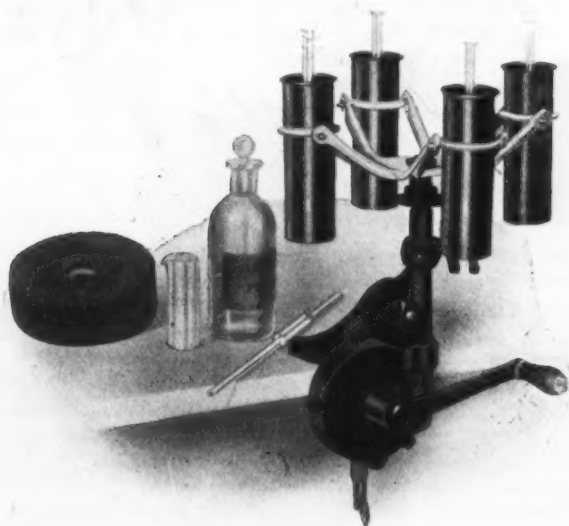


Fig. 3.—Luther Grinder Used in Connection with a Babcock Milk Tester.

As a grinder, the outfit consists of one medium grain carborundum wheel, 5 x 1 1/4 in., chisel guide and tool rest. When packed in a 12-in. case the tool weighs 120 lb. The milk testing attachment is furnished in two and four bottle types for both milk and cream.

The Swan Folding Handle Drawing Knife.

The handles of the folding drawing knife illustrated herewith can be adjusted to four different positions and are held perfectly rigid when set. This is made possible by a number of small projections on the circular ends of the blade frame and corresponding depressions in the circular ends of the handles. The handles are set in the desired position, with the projections in the depressions



The Swan Folding Handle Drawing Knife.

and fastened in this position by the aid of thumb screws. The handles are grooved so as to set over the blades to protect the edges, also making a very compact tool when closed. The knife is referred to as being strongly constructed throughout, and is offered by the James Swan Company, Seymour, Conn.

THE NORVELL-SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo., has recently added to its line the Norleigh Diamond Padlock, which is so designed as to embody the company's diamond trademark device. Another new article is the Norleigh Diamond Boy's Wagon, which is described as an unusually strong and well constructed little cart. To advertise its Armor Clad Whips, which have a center of hippopotamus hide, the company has issued a showcard 9 1/2 x 14 in. in size, describing and illustrating the construction of the Whips and bearing an especially striking illustration of a scantily clad dusky workman stripping the hide from a slain Hippopotamus.

Pyko Grinder and Foot Power Attachment.

In Fig. 1 of the accompanying illustrations is shown one of the line of grinders put on the market by the Pike Mfg. Company, Pike, N. H. The machine is designed for

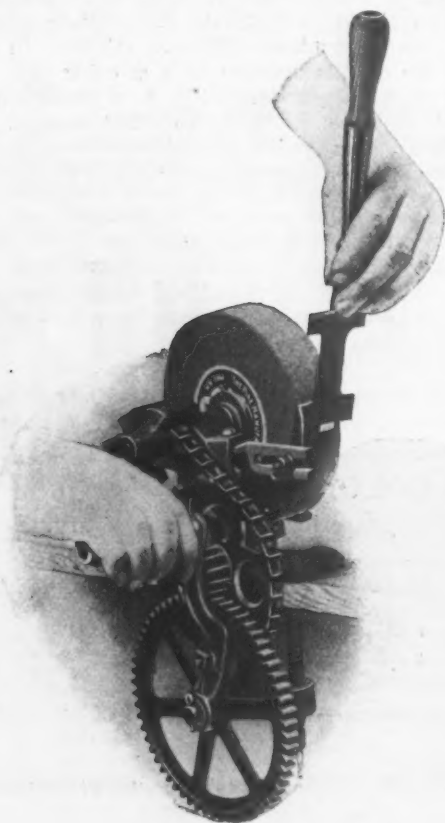


Fig. 1.—Pyko Grinder No. 3A.

use in woodworking, machine, blacksmith and wheelwright shops, automobile garages and lumber camps, for farmers and contractors, and for all places where a power driven grinder is not available. The grinder is the



Fig. 2.—Pyko Foot Power Attachment.

same as the company's No. 3, with the addition of the chisel and plane bit grinding attachment and a coarse grit corundum wheel, 6 x 1 1/4 in. for grinding heavy and nicked tools, castings, &c. The grinder is alluded to as strongly

constructed, every part subjected to strain being made of the highest grade malleable castings. All bearings are extra long, and the two principal bearings have overhanging dust caps to make them practically dustproof. The clamp will grasp any table or bench from 1 to 4 in. thick. The foot power attachment shown in Fig. 2 can be attached to the Nos. 2 and 3 Pyko grinders. This leaves both hands free for sharpening tools, cleaning knives, polishing silver ware, jewelry, &c. The attachment is made of malleable iron, nonbreakable, and is adjustable to benches or tables of different heights.

The Perfect Cooker.

The cooker herewith illustrated and offered by the Republic Metalware Company, Buffalo, N. Y., consists of a deep water pan, a roll rim food pan and a cover inclosing both. The roll rim of the food pan fits snugly over the top edge of the water pan and is perforated with several series of holes for the introduction of steam into the food compartment. The point is made that the food is rapidly cooked because of the perforations, that

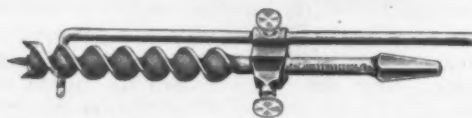


The Perfect Cooker.

the food is entirely inclosed and surrounded by heat and that the food pan is wide and shallow, thus presenting a large surface against which to apply the heat. It is further explained that it is impossible to scorch or burn the food; also that no watching is required, that foreign matter is kept out, and cooking odors are kept in, and that the device is adapted to cooking a wide variety of things, including fruits, puddings, cereals, vegetables, soups, &c. The cooker is supplied with side handles and is furnished in two styles—retinned and enameled. It can also be supplied with retinned water pan and cover and enameled food pan. The pans can be used separately if desired. The water pan is 4 1/4 in. deep and 10 in. in diameter, a suitable size for potatoes, cabbage, &c. The food pan is 3 in. deep and 11 in. in diameter (over rim), and may be found useful for cooking tomatoes, peas and any of the smaller vegetables.

The Swan Depth Gauge.

The James Swan Company, Seymour, Conn, is offering the bit gauge shown, in connection with a bit, in the ac-

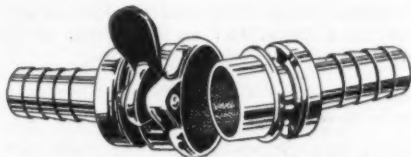


The Swan Depth Gauge.

companying illustration. The cast clamp is nickel plated and is adjustable on any bit and also on the gauge by means of knurled headed screws. The polished gauge is accurately graduated and can be set for any depth from 1-16 up to 6 in.

The Time Saving Hose Coupler.

A new hose coupler for which simplicity, rapidity in connection and efficiency are claimed by the manufacturer is illustrated herewith. The device which has been patented is placed on the market by A. W. Findlay Company, Twenty-third and Market streets, Philadelphia,



Clamp Section. Hose Section.
Time Saving Hose Coupler, Open.

Pa., and is made in different styles to meet the requirements of the usual garden, steam, fire and air hose. That shown in the accompanying illustration is the type used for the ordinary garden hose. The coupler which is made of brass is shown open, the two sections being firmly held together when closed by means of a hinged

clamp, the portion engaging the opposite section having a cam or wedge shaped face which enters the groove of the hose section, but very little pressure being required to force it up tight. The end of the section bears on a heavy rubber washer, which is held firmly in position in a recessed portion at the rear of the socket, and makes a perfectly tight joint, which for this class of service has been tested up to 250 lb. pressure. There are no springs, threads or wearing parts in connection with this coupler, the cam will enter the groove at any point, and it is only necessary to put the two sections together and close the cam clamp, which action locks the same. For fire, air and steam hose, where increased pressure is used, the couplers are made with longer shanks and have two cam clamps, one on either side, and so equipped have without difficulty withstood a water pressure of 575 lb. The Time-Saving coupler is made in the usual sizes from $\frac{1}{2}$ to 3 in. in diameter, valve and faucet connections, nipples, sockets and special gas heater connections also being made in varying sizes.

C. L. Waldo has been succeeded in the Hardware business at Colfax, Iowa, by O. R. Tripp & Sons.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—		China Clay, Imported, 100 lb.		Blue, Ultramarine.....		Black Drop, English.....	
		P gal.		P lb.		P lb.	
Linseed, Western, Raw.....	46 @47	Cobalt, Oxide.....		Brown, Vandyke.....		Black, Ivory.....	
State, Raw.....	46 @47	Whiting, Commercial.....		Green, Chrome.....		Lamp, commercial.....	
City, Raw.....	46 @47	Gilders.....		Green, Paris.....		Blue, Celestial.....	
Boiled, 1c gal. advance on Raw.	46 @47	Ex. Gilders.....		Sienna, Raw.....		Blue, Chinese.....	
Raw, Calcutta, in bbls.....	70 @71	Putty, Commercial—P 100 lb.		Sienna, Burnt.....		Blue, Prussian.....	
Lard, Prime, Winter.....	72 @73	In bladders.....		Umber, Raw.....		Blue, Ultramarine.....	
Extra No. 1.....	51 @52	In bbls, or tubs.....		Umber, Burnt.....		Brown, Spanish.....	
No. 1.....	49 @50	In 1 lb to 5 lb cans.....		White and Red, Lead &c.—		Carmine, No. 40.....	
Cotton-seed, Crude, f.o.b. mill.....	30 @31	In 12½ to 50 lb cans.....		Lead, English white, in Oil.....		Green, Chrome, ordinary.....	
Summer Yellow, prime.....	38½ @39	Spirits Turpentine—P gal.		Lead, American White:		Green, Chrome, pure.....	
Summer, White.....	40 @41	In Oil bbls.....		Dry and in Oil, 100, 250 and		Other, American.....	
Yellow Winter.....	44 @45	In machine bbls.....		500 lb kegs.....		American Golden.....	
Tallow, Acidless.....	58 @59	Glue—		Dry and in Oil, 25 and 50		French.....	
Menhaden, Brown, Strained.....	34 @35	Cabinet.....		lb kegs.....		Foreign Golden.....	
Northern Crude.....	27 @28	Common Bone.....		Dry and in Oil, 12½ lb kegs.....		Orange Mineral, English.....	
Southern.....	23½ @24	Extra White.....		In Oil, 25 lb tin pails.....		French.....	
Light Strained.....	34 @35	Fish, liquid, 50 gal. bbls., per gal.		In Oil, 12½ lb tin pails.....		German.....	
Bleached Winter.....	36 @37	Foot Stock, White.....		In Oil, 1, 2, 3 and 5 lb tin		American.....	
Ex. Bleached Winter.....	38 @39	Foot Stock, Brown.....		cans, ass't.....		Red, Indian, English.....	
Cocoonut, Ceylon.....	6½ @6½	German Common Hide.....		Red Lead and Litharge:		American.....	
Cochin.....	7½ @7½	German Hide.....		In 100 lb kegs.....		Red, Turkey, English.....	
Cod, Domestic, Prime.....	38 @39	French.....		In 25 and 50 lb kegs.....		Red, Tuscan, English.....	
Newfoundland.....	40 @41	Irish.....		In 12½ lb kegs.....		Red, Venetian, Amer.....	
Red, Elaine.....	40 @41	Low Grade.....		In lots of less than 500 lbs,		English.....	
Saponified.....	5½ @5½	Medium White.....		4c P lb advance over		Sienna, Italian, Burnt and	
Olive, Yellow.....	\$1.15 @1.25	Gum Shellac—		above prices of White and		Powdered.....	
Neatsfoot, Prime.....	55 @56	Bleached, Commercial.....		Red Lead and Litharge		Italian, Raw, Powdered.....	
Palm, Lagos.....	6 @6½	Rope Dry.....		Lead, American. Terms: On lots of		American, Raw.....	
Mineral Oils—		Button.....		500 lb and over, 60 days, or 2% for		American Burnt and Pow'd.....	
Black, 29 gravity, 25 @30 cold	13 @13½	Diamond T.....		cash if paid in 15 days from date of		Talc, French.....	
test.....	13 @13½	Fine Orange.....		invoice.		American.....	
29 gravity, 15 cold test.....	13½ @14	A. C. Garnet.....		Zinc, Dry—		Terra Alba, French.....	
Summer.....	12½ @13	G. A. L.....		American, dry.....		English.....	
Cylinder, light filtered.....	20½ @21	Kala Button.....		Red Seal (French process).....		American...P 100 lb, No. 1.....	
Dark, filtered.....	18 @19	D. C.....		Green Seal.....		American...P 100 lb, No. 2.....	
Paraffine, 903-907 sp. gravity.....	14½ @15	Occasion B.....		German Red Seal (French		Umber, T'key, Bnt. & Pow.....	
903 sp. gravity.....	13½ @14	T. N.....		process).....		Turkey, Raw and Powdered.....	
983 sp. gravity.....	11 @11½	V. S. O.....		Green Seal.....		Burnt, American.....	
Red.....	13½ @14	Colors in Oil—		White Seal.....		Raw, American.....	
Miscellaneous—		Black, Lampblack.....		French, Red Seal.....		Yellow, Chrome, Pure.....	
Barrite:		Blue, Chinese.....		Green Seal.....		Vermillion, American Lead.....	
White, Foreign.....	P ton \$18.50 @20.50	Blue, Prussian.....		Dry Colors—		Quicksilver, bulk.....	
Amer. floated.....	P ton 17.00 @18.00			Black, Carbon.....		Quicksilver, bags.....	
Off color.....	P ton 12.50 @15.00			Black Drop, American.....		English, Imported.....	
Chalk, in bulk.....	P ton 3.00 @ 3.40					Chinese.....	

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33%
North's.....10%
Upon's Patent, $\frac{1}{2}$ gro., \$29.90.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....10%
Ives' Stop Bead Screws and Washers.....10%
Taplin's Perfection.....10%

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, $\frac{1}{2}$ doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 4, \$1.00; 5, \$0.50.
Fernald Quick Shifter, $\frac{1}{2}$ doz. pairs.....\$2.00@3.00

Anvils—American—

Eagle Anvils..... $\frac{1}{2}$ lb. @ 8¢
Hay-Budden, Wrought..... $\frac{1}{2}$ lb. @ 9¢
Trenton..... $\frac{1}{2}$ lb. @ 9¢

Imported—

Swedish Solid Steel Sisco, Superior, $\frac{1}{2}$ lb. @ 10¢
Peter Wright & Sons, $\frac{1}{2}$ lb. 84 to 340 lb., 11¢; 350 to 600 lb., 11¢.

Anvil, Vice and Drill—

Millers Falls Co., \$18.00.....15¢10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.....10%

Augers and Bits—

Com. Double Spur.....75¢10@80%
Jennings' Patn., Bright.....65¢10@70%
Black Lip or Blued.....65¢6@65%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40¢10%
Ford's Auger and Car Bits.....40¢10%
Ft. Washington Auger Co., Concord's.....35%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co., No. 10 ext. lip, R. Jennings' list, 25¢7½%

No. 30, R. Jennings' list, 25¢7½%
Russell Jennings.....25¢10@25%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....20%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60%
Snell's King Auger Bits.....50%
Swan's.....65¢10@70%
Swan's, Jennings' Pattern.....50%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1, $\frac{1}{2}$ doz., \$38; No. 2, \$18.....60¢10%
Ford's, Clark's Pattern.....60¢5@60¢10%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, \$18.00; large size, \$26.00.....60¢10%
Swan's.....60%

Gimlet Bits—

Common Dbl. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10, \$4.75; No. 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$5.50@6.00
Ames.....20¢10%
Universal.....20%

Ship Augers and Bits—

Ship Augers.....40¢10%
Ford's.....35¢45%
C. E. Jennings & Co., L'Hommedieu's.....6%
Watrous.....33¢7½%
Snell's.....48%

Awl Hafts—See Handles, Mechanics' Tool.

Awls—

Brad Awls:
Handled.....gro. \$2.75@3.00
Unhanded, Shiddered.....gro. 65¢@66¢
Unhanded, Patent.....gro. 66¢@70¢
Peg Awls:
Unhanded, Patent.....gro. 31¢@34¢
Unhanded, Shiddered.....gro. 65¢@70¢
Scratch Awls:
Handled, Com.....gro. \$1.50@1.00
Handled, Rock.....gro. \$1.50@1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights: Per doz.
First Quality.....\$4.75@5.00
Second Quality.....\$4.25@4.50
Double Bit, base weights:
First Quality.....\$7.00@7.50
Second Quality.....\$6.50@6.75

Axle Grease—

See Grease, Axle.

Axles—

Concord, Loose Collar.....4¼¢1¼¢
Concord, Solid Collar.....4¼¢5¢
No. 1 Common, Loose.....3¼¢1¼¢
No. 1½ Com., New Style.....4¼¢4¼¢
No. 2 Solid Collar.....4¼¢4¼¢
Half Patent:
Nos. 7, 8, 11 and 12.....70%
Nos. 13 to 14.....70%
Nos. 15 to 18.....70¢10¢70¢10¢5%
Nos. 19 to 22.....70¢10¢70¢10¢5%

Boxes, Axes—

Common and Concord, not turned.....lb., 5¢6¢
Common and Concord, turned, lb., 6¢7¢
Half Patent.....lb., 9¢10¢

Bait—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20¢5%

Fishing—

Balances—

Caldwell new list.....50¢10%
Pullman.....50¢10%

Spring—

Light Spring Balances.....60¢60¢5%
Chatillon's:
Light Spg. Balances.....50¢50¢10%
Straight Balances.....40¢40¢10%
Circular Balances.....50¢50%
Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—

Steel Crowbars, 10 to 40 lb., per lb., \$4 @ 11½¢

Towel—

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$ gro. \$8.50

Beam, Scale—

Scale Beams.....40%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co., No. 12 Wire Coppered $\frac{1}{2}$ doz., \$0.80; Tinned.....\$0.85
No. 11 Wire Coppered $\frac{1}{2}$ doz., \$1.15; Tinned.....\$1.20
No. 10 Wire Tinned..... $\frac{1}{2}$ doz., \$1.50

Beaters Egg—

Dover Stamping & Mfg. Co., Genuine Dover, per gro., No. 1, Tumbler Size, \$1.50; No. 2, Family Size, \$1.50; No. 3, Extra Family Size, \$2.00; No. 4, Hotel Size, \$3.00.

Holt-Lyon Co., Holt, per doz., No. 5, Jap'd, \$0.80; No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.55; No. 6, Jap'd, \$1.63; No. 7, Jap'd, per doz., No. 2, \$1.35.

Taplin Mfg. Co., Improved Dover, per gro., No. 60, \$6.00; No. 75, \$6.50; No. 100, \$7.00; No. 102, Tin'd, \$8.50; No. 150, Hotel, \$15.00; No. 152, Hotel Tin'd, \$17.00; No. 200, Tumbler, \$8.50; No. 202, Tumbler Tin'd, \$9.50; No. 300, Mammoth, per doz., \$25.00.

Bellows—

Blacksmith, Standard List:
Split Leather.....60¢10@65%
Grain Leather.....50¢80¢10%

Hand—

Inch.....6 7 8 9 10
Doz. \$4.00 5.50 6.00 6.50 7.50

Molders—

Inch.....10 12 14 16
Doz. \$7.50 9.00 12.00 15.00

Bells—

Wrought Cow Bells.....75%
Jersey.....75¢10%
Texas Star.....50%

Door—

Home, R. & E. Mfg. Co.'s.....55¢10%

Hand—

Polished, Brass.....60¢@60¢10%
White Metal.....60¢@60¢10%
Nickel Plated.....50¢10%
Sicag.....50¢10%
Cone's Globe Hand Bells.....33½¢35%

Miscellaneous—

Farm Bells.....lb., 2¼¢@2¼¢
Church and School.....60¢@60¢10%

Belting—

First Quality, Ex. Hy., Strictly Short Lap.....60¢10%
Standard.....70¢10¢70¢10¢5%
Light Double.....75¢10%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 23¢24¢

Rubber—

Competition (Low Grade).....70¢10¢75%
Standard.....60¢10¢70%
Best Grades.....40¢50%

Bench Stops—

See Stops, Bench

Benders and Upsetters,

Tire—
Green River Tire Benders and Upsetters.....20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1908 list:
Chain, Parts, Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks Tackle—

Common Wooden.....75¢75¢5%
B. & L. B. Co., Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50¢10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50¢10%; Wire Rope Snatch, 50%.

Lane's Patent, Automatic Lock and Junior.....30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....55%
Embossed.....55%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Kenfel & Esser Co.....33½¢10%

Bolts

Carriage, Machine, &c.—Common Carriage (cut thread):
¾ x 6 and smaller.....75¢5¢
Larger and longer.....70¢5¢
Phila. Eagle, \$3.00 list.....80¢10%
Bolt Ends.....70¢10%
Machine (Cut Thread):
¾ x 4 and smaller.....75¢10%
Larger and longer.....70¢10%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knobs:
Inch.....9 4 6 8
Per doz. \$0.30 .35 .45 .60 .80

Cast Iron Spring Foot, Jap'd:
Inch.....6 8 10
Per doz. \$1.20 1.50 2.25

Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz. \$1.00 1.40 1.65

Cast Iron Flat Shutter, Jap'd, Brass Knobs:
Inch.....6 8 10
Per doz. \$0.75 .95 1.25

Wrought Barrel Japanned,

Barrel Bronzed.....80¢10@80¢10%
Spring.....70¢10¢70¢10¢5%
Shutter.....50¢5¢50¢10¢5%
Square Neck.....75¢75¢10%
Square.....70¢10¢10%
Ives' Mortise.....10%
Ives' Wrought Metal.....10%

Expansion—

F. H. Evans' Crescent.....40¢@40%
Richards Mfg. Co.....55¢10%
Star Expansion Bolt Co.:
Star Lag Screw Type.....60¢10¢5¢2¼%
Star Wood Screw Type.....40%
Star Machine, Single Wedge.....60%

Star, Machine, Double Wedge.....60%
Steward & Romain Mfg. Co.:
Style No. 13, Double.....60%
Style No. 1, Single.....60%
Style No. 100, Dbl. Jaw, Single.....55%
Lag Screw.....60%

Plow and Stove—

Plow.....65¢5¢70%
Stove.....85¢85¢5%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Co.:
Norway Phila., list Oct. 14, '04.....80%
Eagle Phila., list Oct. 16, '04.....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '04.....80%
Eagle Phila., list Oct. 16, '04.....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. '04.....80%
Eagle.....82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16, 1881.....82½%
Unson Nut Co.:
Tire Bolts.....72½%

Borers, Bung—

Borers Bung, Ring, with Handle:
Inch.....1¼ 1½ 1¾ 2
Per doz. \$4.30 5.60 6.40 8.00

Inch.....2¼ 2½ 2¾ 3
Per doz. \$8.65 11.50

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....25%
Langdon, New Langdon and Langdon Improved, 20¢10%; Langdon Acme.....15¢10%
Perfection.....40%
Seavey.....45%

Braces—

Common Ball, American.....\$1.50
Barber's.....50¢10¢10¢60¢10%
Fray's Genuine Spoford's.....50%
Fray's No. 61, 165, 256, 614.....50%
C. E. Jennings & Co.....50%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat. 50%
Millers Falls Drill Braces.....25¢10%
P. S. & W. Co., Peck's Pat.....60¢10%

Brackets—

Wrought Steel.....75¢10¢5¢80%
Bradley Metal Clasp.....80¢10¢80¢10¢5%
Griffin's Pressed Steel.....75¢5¢10%
Griffin's Folding Brackets.....70¢10%
Taplin Victor Handy Egg Beater Bracket..... $\frac{1}{2}$ doz., \$1.50

Bright Wire Goods—

See Wire and Wire Goods.

Broilers—

Kilbourne Mfg. Co.....75¢20%
Wire Goods Co.....75%

Buckets, Galvanized—

Mfr's list, price per gross:
Quart.....10 12 14
Water, Reg., 26.85 29.50 33.50
Water, Hy., 45.35 48.00 52.00
Fire, Rd. Btm., 32.00 34.65 38.65
Well.....37.35 41.35 45.35

Bull Rings—See Rings, Bull.

Butts—

Wrought, High List, Oct. 6, '06, 65%
Cast Brass, Tiebout's.....40¢10%

Cast Iron—

Fast Joint, Broad.....40¢10¢50%
Fast Joint, Narrow.....40¢10¢50%
Loose Joint.....70¢10¢75%
Loose Pin.....70¢10¢75%
Mayer's Hinges.....70¢70¢45%
Parliament Butts.....70¢70¢45%

Wrought Steel—

Bright,
Light Narrow, Light Reversible.....70¢5%
Reversible and Broad.....70¢5%
Loose Joint, Narrow, Light Inside Blind, &c.....70%
Back Flaps, Table Chest, 65% Japanned.

Light Narrow, Loose Pin,

40¢5%
Broad.....60%
Steeple Tipped.....70%
Ball Tipped.....70%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900
Hendryx Bronze: Series 700, 800, 30%
Hendryx Enamelled.....35%

Calipers—See Compasses.**Calks, Toe and Heel—**

Blunt, 1 prong, per 100 lb., \$3.50 @ \$3.85
Sharp, 1 prong, per 100 lb., \$5.00 @ \$5.35

Burke's, 1 pr. Blunt Toe, 3/4¢; 2 pr. Blunt Toe, 4/4¢; 1 pr. Sharp Toe, 1/4¢; 2 pr. Sharp Toe, 1/4¢; Blunt Heel, 4/4¢; Sharp Heel, 4/4¢; Lautier, Blunt, 4/4¢; Sharp, 4/4¢; Perkins, Blunt, 1 lb, 3.65¢; Sharp, 4.15¢

Can Openers—

See Openers, Can.

Caps, Percussion—

Eley's E. B.52¢ @ 55¢
F. D.per M 3/4 @ 35¢
G. L.per M 40¢ @ 42¢
G. E.per M 48¢ @ 50¢
Musketper M 62¢ @ 63¢

Primers—

Berdan Primers, \$2 per M. 20¢
Primer Shells and Bullets. 15¢ @ 10¢
All other primers per M. \$1.52 @ 1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:
32 C. F., \$5.5010¢ @ 5¢
38 O. F., \$7.0010¢ @ 5¢
32 cal. Rim, \$1.5010¢ @ 5¢
32 cal. Rim, \$2.7510¢ @ 5¢
B. B. Caps, Con. Ball, Sogd. \$1.90
B. B. Caps, Round Ball\$1.90
Central Fire25¢
Target and Sporting Rifle. 15¢ @ 10¢
Primer Shells and Bullets. 15¢ @ 10¢
Rim Fire, Sporting50¢
Rim Fire, Military15¢ @ 5¢

Castors—

Bed65¢ @ 10¢ @ 70¢
Plate60¢ @ 60¢ @ 5¢
Philadelphia70¢ @ 10¢ @ 75¢
Acme, Ball Bearing35¢
Gem (Roller Bearing)70¢ @ 10¢ @ 5¢
Steel Gem (Roller Bearing)70¢
Standard Ball Bearing45¢
Yale (Double Wheel) low list. 40¢ @ 10¢

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
3-16 1/4 5-16 3/4 1/2 1/4
\$7.80 5.20 4.25 3.60 3.40 3.20
1/4-1/2 1/4 1/2 to 1 1/4 inch.
\$3.10 3.20

In cast lots, deduct 25¢.

German Coil70¢
German Pattern Coil:
6-0 to 170¢ @ 10¢ @ 5¢
2 and 360¢ @ 10¢ @ 70¢
4, 5 and 650¢ @ 10¢ @ 40¢ @ 5¢

Halter—

Halter Chains60¢ @ 10¢ @ 5¢
German Pattern Halter Chains.
List July 24, '9760¢ @ 10¢ @ 70¢
Covert Mfg. Co.35¢ @ 5¢
Halter35¢ @ 5¢

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/2-6-3, Straight, with ring \$28.00
6 1/2-6-2, Straight, with ring \$29.00
6 1/2-8-2, Straight, with ring \$32.00
6 1/2-10-2, Straight, with ring \$37.00

NOTE—Add 2c per pair for Hooks
Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c.60¢ @ 10¢ @ 60¢ @ 10¢ @ 5¢

Miscellaneous—

Jack Chain, list July 10, '93:
Iron60¢ @ 10¢ @ 60¢ @ 10¢ @ 10¢
Brass65¢
Safety and Plumbers' Chain. 75¢
Gal. Pump Chain4 1/2¢ @ 5¢
Bridgeport Chain Co.:
Triumph Halter and Coil. 35¢ @ 24¢ @ 40¢
Triumph Dog50¢ @ 10¢ @ 60¢
Brown Halter and Coil. 45¢ @ 50¢ @ 5¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion
Oneida Community:
American Halter, Dog and Kennel
Chains35¢ @ 24¢ @ 40¢
Niagara Dog Leads and Kennel
Chains45¢ @ 50¢ @ 5¢
Wire Goods Co.:
Dog Chain70¢
Universal Dbl.-Jointed Chain70¢

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain60¢
Pullman:
Bronze Chain, 60%; Steel Chain,
Coppered60¢ @ 10¢
Sash Chain Attachments, per set. 8¢
Aluminum Sash Ribbon, per 100
ft. \$2.00 @ 35.00
Sash Ribbon Attachments, per set. 8¢

Chalk—

Carpenters' Bluegro., 50¢
Carpenters' Redgro., 50¢
Carpenters' Whitegro., 40¢

Checks, Door—

Rardley's45¢
Pullman, per gro.35¢ @ 10¢
Russwin35¢ @ 10¢

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools55¢
Youths' Chests, with Tools40¢
Gentlemen's Chests, with Tools30¢
Farmers' Carpenters, etc., Chests
with Tools20¢
Machinists' and Pipe Fitters'
Chests, Empty45¢
Tool Cabinets45¢
C. E. Jennings & Co.'s Machinists'
Tool Chests75¢ @ 10¢

Chisels—

Socket Framing and Firmer
Standard List80¢ @ 10¢ @ 30¢
Buck Bros.30¢
C. E. Jennings & Co.:
Socket Firmer No. 1025¢ @ 7 1/2¢
Socket Framing No. 1525¢ @ 7 1/2¢
Swan's66¢ @ 70¢
L. & I. J. White & Co.30¢ @ 30¢ @ 5¢

Tanged—

Tanged Firmers30¢ @ 35¢ @ 30¢
Buck Bros.30¢
C. E. Jennings & Co. Nos. 191, 181, 25¢
L. & I. J. White Co.25¢ @ 5¢

Cold—

Cold Chisels, good quality. 13¢ @ 15¢
Cold Chisels, fair quality. 11¢ @ 12¢
Cold Chisels, ordinary. 9¢ @ 10¢

Chucks—

Almond Drill Chucks35¢
Almond Turret Six-Tool Chuck40¢
Beach Pat, each \$8.0035¢ @ 5¢
Empire25¢
Blacksmiths'25¢
Jacobs' Drill Chucks35¢
Pratt's Positive Drive25¢
Skinner Lathe Chucks:
Independent35¢
Universal, Reversible Jaws35¢
Universal, Com. Style Jaws40¢
Combination, Reversible Jaws40¢
Combination, Com. Style Jaws40¢
Round Body or Box Body, 2 Chuck
Jaws25¢
Geared Scroll Chucks25¢
Drill Chucks:
New Model, 25%; Geared Pat-
tern, 25%; Skinner Patent,25¢
Positive Drive20¢
Planer Chucks20¢
Standard45¢
Drill Press Vises30¢
Face Plate Jaws35¢
Standard Tool Co.:
Improved Drill Chuck45¢
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6,
7, 8 and 17, 40%; No. 2135¢
Scroll Combinations, Nos. 83 and
8430¢
Geared Scroll, Nos. 33, 34 and 35, 25%
Independent Iron, Nos. 19 and 18, 35%
Independent Steel, No. 1935¢
Union Drill, Nos. 000, 09, 100, 101,
102, 103, 10435¢
Union Czar Drill25¢
Universal, 11, 12, 16, 17, 13, 14, 15, 40%
Universal No. 4235¢
Iron Face Plate Jaws, Nos. 28, 30,
3135¢
Steel Face Plate Jaws, Nos. 70 and
7230¢
Westcott Patent Chucks:
Lathe Chucks50¢
Little Giant Auxiliary Drill50¢
Little Giant Double Grip Drill50¢
Little Giant Drill, Improved50¢
Oneida Drill50¢
Scroll Combination Lathe50¢
Whitaker Mfg. Co.:
National Drill25¢

Clamps—

Carriage Makers', Star, P., S. & W.
Co.50¢
Besly, Parallel33¢ @ 10¢
Hammer & Co.:
Adjustable20¢ @ 5¢
Carriage Makers' H. P. Screw. 40¢ @ 5¢
Meyers' Hay Rack50¢
Lineman's Swedish Neverturn65¢
Saw Clamps, see Vises, Saw Fliers

Cleaners, Drain,

Iwan's Champion, Adjustable50¢
Iwan's Champion, Stationary40¢

Sidewalk—

American Fork & Hoe Co.:
Shank\$4.00
Shank, 1/2 doz., X 7 1/2, \$3.50; Shank
X 8\$3.75

Cleavers, Butchers'—

Foster Bros.30¢
Fayett's B. Plumb30¢
L. & I. J. White Co.30¢

Clippers, Horse and**Sheep—**

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each \$10.75
20th Century Horse, each \$15.00
Lightning Belt Horse, each \$15.00
Chicago Belt Horse, each \$20.00
Stewart's Enclosed Gear Roll
Bearing Horse, each \$6.75
Stewart's New Model Sheep
Shearing Machine, each \$12.75
Stewart Enclosed Gear Shear-
ing Machine, No. 8, each \$9.75

Clips, Axle—

Regular Styles, list July 1, '05,
80¢ @ 80¢ @ 10¢

Cloth and Netting, wire

—See Wire, &c.

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene,
Racking, Liquor, Bottling,
&c75¢
Compression Bibbs70¢

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Sons list40¢
Leather, Walter B. Stevens & Sons
list40¢

Compasses, Dividers, &c.

Ordinary Goods70¢ @ 10¢ @ 75¢

Conductor Pipe—

L. C. L. to Dealers:
Gal. Steel, Charcoal, Copper.
Northeastern: 50¢ @ 10¢ @ 7 1/2¢ 50¢ @ 10¢
70¢ @ 10¢
Eastern: 50¢ @ 10¢ @ 7 1/2¢ 50¢ @ 10¢
70¢ @ 10¢
Central: 75¢ @ 5¢ 60% 4 50¢ @ 10¢
Northwestern: 75¢ @ 2 1/2¢ 60% 50¢ @ 10¢
Western: 70¢ @ 7 1/2¢ 50¢ @ 12 1/2¢ 50¢ @ 5¢
Tennessee: 70¢ @ 10¢ 50¢ @ 12 1/2¢ 50¢ @ 10¢
Southern: 70% 50¢ @ 12 1/2¢ 50¢ @ 5¢
Southeastern: 70% 50¢ @ 5¢ 50¢ @ 5¢

Terms, 60 days; 2 1/2 cash 10 days. Fac-
tory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Gal.2 3 4 6 8
Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.90 \$3.90
Galvanized, Lined, side handles,
Gal.2 3 4 6 8
White Enamelled10%
Agate Lined10%

Coppers' Tools—

See Tools, Coppers'.

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair
and heavier, 20¢; lighter
than 3 lb. to pair22¢

Cord—

Braided, Drablb. 35¢
Braided, White, Com., Nos. 8
to 12, 21¢; No. 7, 21 1/2¢; No. 6,
22 1/2¢. In lots of 12 doz. or
over, 1 cent less per pound.
Cable Laid Italian, lb., No. 18, 57¢
Italian, lb., A. No. 18, 25¢; B, 22¢
Common Indialb., 11¢ @ 11 1/2¢
Cotton Sash Cord, Twisted, 18 @ 20¢
Patent Russialb., 23¢
Cable Laid Russialb., 21¢
India Hemp, Br'd'd.,lb., 21¢
India Hemp, Twisted,lb., 13¢ @ 14¢
Patent India, Twisted,lb., 17¢
Pearl Braided, cotton, No. 6, 30 lb.
20 1/2¢; No. 7, 19 1/2¢; Nos. 8 to 12,
19 1/2¢, in 12 doz. to 100 doz. lots,
Eddystone, Braided, Nos. 8 to 12,
26¢; 7, 26 1/2¢; 6, 27 1/2¢.
Harmony Cable Laid Italian, Nos. 7
Pullmanlb. 23¢
Wire Sash Cord10%
Sash Cord Attachments, per 100, \$2.00
Samson, Nos. 8 to 12:
Braided, lb., Drab Cotton,
55¢; Italian Hemp, 40¢ @
50¢; Lined, 65¢; White Cot-
ton, 50¢; Spot Cord50¢
Massachusetts, White, lb. 40¢
Massachusetts, Drab, lb. 45¢
Phoenix, White, Nos. 8 to 1227¢
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢;
B, Drab, 40¢; B, White, 35¢;
Italian Hemp, 40¢; Lined, 57 1/2¢
See also Chain and Ribbon.

Wire, Picture—

Full Length90¢ @ 10¢
Short Length90¢ @ 20¢ @ 10¢
Hendryx Standard Wire Picture Cord,
Turner & Stanton Co. Wire Picture
Cord90¢

Cradles—

Grain50%

Crayons—

White Round Crayons, Cases, 100
gro., \$8.00, \$8.50, \$9.00 and \$10.00
according to grade.
Zelmer's Lumber: \$9 gro.
White and Purple, Indelible\$7.50
Blue, Red, Green, Yellow and
Terra Cotta, \$6.50; Black\$4.50
Giant Lumber, 5 1/4 in. x 15-16 in.
round, all colors, \$12.00; Indel-
ible, \$14.00; Blacks\$10.00
Genuine Soapstone, Metal Workers',
5 in. x 3/4 in. Round, \$2.50; 5 in. x
1/4 in. Square, \$1.75; 5 x 1 1/2 x 3-16,
\$2.50; 5 x 1 1/4 x 3-16\$3.00
Suremark, Black, \$2.25; Blue, Red
and Yellow\$2.50

Crooks, Shepherds'—

American Fork & Hoe Co.:
Montana\$ doz. \$4.50

Crow Bars—See Bars, Crow.**Cultivators—**

American Fork & Hoe Co.:
Victor Garden50¢ @ 10%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, 3 doz. \$3.50
Star, Eagle, Rogers & Hamilton
and Anchor\$ doz. \$3.00
Wm. Rogers & Son\$ doz. \$2.50

Cutters—

H. H. Mayhew Co.40%
Red Devil60%
B. Mfg. Co.40%
Woodward50%

Meat and Food—

American30%
Nos.401 402 403 404 405 406 407
Each\$5 \$7 \$10 \$12 \$25 \$50 \$60
Enterprise:
Nos.5 10 12 22 32
Each\$2 \$3 \$2.75 \$4.50 \$6 25¢ @ 25¢ @ 7 1/2¢
No. 202, \$1.5040¢ @ 7 1/2¢
P. S. & W. Co.:
Ideal40¢ @ 10¢ @ 5%

Hales60¢ @ 5¢
Little Giant\$ doz. 40¢ @ 50¢
Nos.305 310 312 320 322
\$35.00 \$18.00 \$44.00 \$72.00 \$68.00
New Triumph No. 605, \$ doz. \$24.00

Russwin Food, No. 1, \$24.00; No. 2,
\$27.00; 3, \$42.0045¢ @ 10¢ @ 10¢
\$15.00 \$18.00

Enterprise Beef Shavers—

Slaw and Kraut—
Henry Disston & Sons:
Slaw and Kraut Cutters35%
Corn Graters30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife\$ doz. \$3.00
Combined Slaw Cutter and Corn
Grater\$ doz. \$4.00

Tobacco—
All Iron, Cheap.\$ doz. \$4.25 @ 4.50
Enterprise25¢ @ 30¢
National, \$ doz., No. 1, \$21; No. 2,
\$1840%

Diggers, Post Hole, &c—

Disston's:
Rapid, \$ doz., \$24.0025%
Samson, \$ doz., \$34.0025%
Iwan's Pat. Post Hole and Well
Auger40%
Vaughan Pattern Post Hole Augers,
\$ doz. \$7.00
Perfection Post Hole Diggers,
\$ doz. \$8.50
Split Handle Post Hole Diggers,
\$ doz. \$7.50
Hercules Pattern, \$ doz. \$9.50
Kohler's, \$ doz., Universal, \$14.00;
Little Giant, \$12.00; Hercules,
\$10.00; Invincible, \$9.00; Rival,
\$8.50; Pioneer\$7.50
Never-Break Crucible Steel Post
Hole Diggers60%

Dividers—See Compasses.**Drawing Knives—**

See Knives, Drawing.

Dressers Emery Wheel—

Sterling Emery Wheel Dressers35%
Sterling Wheel Dresser Cutters35%

Drills and Drill Stocks—

Blacksmith's Common Drilling
Machines\$1.50 @ 1.75
Breast, Millers Falls15¢ @ 10¢
Breast, P. S. & W.30¢
C. & C. Ratchet25¢
Reversible Ratchet Die Stocks25¢
Goodell Automatic Drills, \$10 @ 10¢
Millers Falls Automatic Drill
Graves, per doz., Nos. 1, \$4.86;
2, \$4.16
Millers Falls Automatic Drills, 33 1/2¢ @ 10¢
Ratchet, Curtis & Curtis25¢
Ratchet, Parker's40¢
Ratchet, Weston's40¢
Ratchet, Weston's, Style H im-
proved40¢ @ 40¢ @ 5¢
Ratchet, No. 01240¢ @ 40¢ @ 5¢
Ratchet, Celebrated40¢ @ 40¢ @ 5¢
Ratchet, Whitney's, P. S. & W.,
40¢ @ 10¢ @ 60%
Whitney's Adjustable, No. 10, \$12.00,
33 1/2%

Twist Drills—

Bit Stock70¢ @ 70¢ @ 5¢
Taper and Straight Shank
60¢ @ 10¢ @ 70%

Drivers, Screw—

Screw Driver Bits, per doz. 45¢ @ 50¢
Balsey's Screw Holder and Driver, \$ doz., 2 1/2-in., \$6; 4-in., \$7.50; 6-in., \$9
Buck Bros', Screw Driver Bits50%
Champion50%
Disston's70%
Fray's Hol. H'dle Sets, No. 3, \$12.50
Ford's Brace Screw Drivers40¢ @ 10¢
Gay's Double Action Ratchet35%
Goodell's Auto.65¢ @ 65¢ @ 10¢
Mayhew's Black Handle40¢
Mayhew's Monarch40¢
Millers Falls, \$ doz., Nos. 11, \$9.95;
12, \$13.73; 20, \$8.17; 21, \$8.46; 41,
\$13.43; 42, \$17.21.
Smith & Hemenway Co. Never-
turn, 66%; Elmora, 60%; Star,
30¢ @ 10%

Eave Trough, Galvanized—

Territory. Gal. Steel, Copper.
Northeastern75¢ @ 10¢ @ 5¢
Eastern80%
Central80¢ @ 10¢ @ 5¢
Northwestern80¢ @ 10¢ @ 5¢
Western80¢ @ 5¢
Tennessee80¢ @ 5¢
Southern75¢ @ 10¢
Southwestern75¢ @ 10¢ @ 1/4¢ 50¢ @ 5¢

Terms, 2 1/2 for cash. Factory shipments
generally delivered.
Note—Lower prices are made in some
sections.

See also Conductor Pipe and Elbows.**Elbows and Shoes—**

Factory shipments, all territories:
Galv. Steel, Galv. C. I. and
Copper.
Sizes 2, 3, 480%
Sizes 1 1/2, 2 1/2, 3 1/2, 5, 660¢ @ 10%
No. 2650%
No. 2425%
Copper Elbows50%

Elbows, Stove Pipe—

Edwards, Standard Blue40¢ @ 10¢ @ 10¢
Edwards, Royal Blue40¢ @ 10¢ @ 10¢
Reeves, Dover, Flat Crimp. 40¢ @ 10¢ @ 5¢

Emery, Turkish—

1 to 5 1/2 to
46: 280: Flour.
Kegslb. 5¢ 5¢ 3 1/4¢
1/4 Kegslb. 5 1/4¢ 5 1/4¢ 3 1/4¢
1/4 Kegslb. 5 1/4¢ 6¢ 4¢

10-lb. cans, 10 in case... 7¢ 6¢
 10-lb. cans, less than 10... 10¢ 8¢
 Less quantity... 10¢ 10¢ 8¢
 NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—

Ford's Auger Bit Extensions... 40¢5%

Ext. actors, emon Juice—

—See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's Jap'd and Galv. 50 & 5%: Bronze and Plated... 50%

Walling's... 50%

Upson's Patent... 40%

Cord and Weight—

Ives, # gro., \$1.08... 10%

Titan, # gro., \$0.66... 15%

Corrugated—

Acme Corrugated Fasteners... 70%

Faucets—

Cork Lined... 50¢10¢60%

Metallic Key, Leather Lined... 60¢10¢70%

Red Cedar... 40¢5¢10¢10¢5%

Petroleum... 70¢10¢75%

B. & L. B. Co.: 60¢10%

Star... 60%

West Lock... 50¢10%

John Sommer's Peerless Tin Key... 40%

John Sommer's Boss Tin Key... 50%

John Sommer's Victor Mtl. Key... 50¢10%

John Sommer's Duplex Metal Key... 40%

John Sommer's Diamond Lock... 50%

John Sommer's I. X. L. Cork Lined... 50%

John Sommer's Reliable Cork Lined... 50¢10%

John Sommer's Chicago Cork Lined... 60%

John Sommer's O. K. Cork Lined... 50%

John Sommer's No Brand, Cedar... 50%

John Sommer's Perfection, Cedar... 40%

Self Measuring: 50%

Enterprise, Self Measuring and Pump, # doz., \$36.00... 40¢10%

Lane's, # doz., \$36.00... 40¢10%

National Measuring, # doz., \$36.00... 40¢10%

Felloc Plates—

See Plates, Felloc.

Files— Domestic—

List Nov. 1, 1899.

Best Brands... 70¢10¢75¢10%

Standard Brands... 75¢10¢80%

Lower Grade... 75¢10¢10¢80¢10%

Gold Medal... 70%

McCaffrey's American Standard... 60¢10¢10%

Imported—

Stubs' Tapers, Stubs' Hat, July 24, '97... 35¢10%

Fixtures, Fire Door—

Richards Mfg. Co.: 104

Universal, No. 103; Special, No. 104... \$3.75

Fusible Links, No. 98... 50%

Expansion Bolts, No. 107... 60¢10%

Grindstone—

Net Prices:

Inch... 15 17 19 21

Per doz... \$3.60 3.85 4.15 4.65

Peck, Stow & Wilcox Co.: 15 17 19 21 25

\$1.00 1.40 1.75 5.50 6.50... 30%

Reading Hardware Co... 60%

Fodder Squeezers—

See Compressors.

Forks—

American Fork & Hoe Co.: 70¢5%

Iowa Dig-Ezy Potato... 70¢5%

Hay, Regular, 4-time... 45¢20¢12%

Hay, Regular, 4-time... 60¢7½¢5%

Champion, Hay... 60¢12%

Acme, Hay... 60¢20%

Manure, Regular, 4-time... 65¢5%

Manure, Regular, 5 and 6 time... 70%

Champion, Manure... 65¢5%

Columbia, Manure... 70%

Acme, 4-time... 60¢10¢5%

Round Shoulder Header, 4-time... 65%

Champion, Header... 65%

Dakota, Header... 65%

Kansas Header... 65%

Wood, Barley... 35¢5%

Steel, Barley... 66%

Columbia, Spading... 70¢7½¢5%

Frames— Wood Saw—

White, S'p't Bar, per doz. \$1.75@2.00

Red, S'p't Bar, per doz. \$1.00@1.25

Red, Dbl. Brace, per doz. \$1.50@1.80

Freezers, Ice Cream—

Qt... 1 2 3 4 6

Each... \$1.25 \$1.60 \$1.90 \$2.20 \$2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse— Per 1000 Feet.

Hemp... \$2.75

Cotton... 3.20

Waterproof Spl. Taped... 3.65

Waterproof Dbl. Taped... 4.40

Waterproof Tpl. Taped... 5.15

10¢2½¢1%

Gates, Molasses and Oil—

Stebbins' Pattern... 80¢80¢5%

Gauges—

Marking, Mortise, &c. 50¢50¢10%

Mapin-Stephens Co.: 50¢50¢10%

Marking, Mortise, &c. 50¢50¢10%

Diston's Marking, Mortise, &c. 67½%

Wire, Brown & Sharpe's... 33½%

Wire, Morse's... 25%

Wire, T. S. & W. Co... 35½%

Gimlets— Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, \$2.00; 2, \$2.30

Spike, Metal, No. 1, \$1.00; 2, \$1.30

Nail, Wood Handled, No. 1, \$2.30; 2, \$2.60

Spike, Wood Handled, No. 1, \$4.50; 2, \$4.60

Glass, American Window

See Trade Report.

Glasses, Level—

Chapin-Stephens Co... 65¢65¢10%

Glue, Liquid Fish—

Bottles or Cans, with Brush, 25¢10¢50%

Elwell's... 40%

Grease, Axle—

Common Grade... gro. \$6.00@6.50

Dixon's Everlasting, 10-lb. pails, ea., 85¢; in boxes, # doz., 1 lb., \$1.20;

2 lb., \$2.00

Helmet Hard Oil... 25%

Griddles, Soapstone—

Pike Mfg. Co... 33½¢33½¢10%

Grinders—

Pike Mfg. Co.: 60¢10%

Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power). 33½%

Mower Knife and Tool, \$5.00, 40¢10%

Royal Mfg. Co.: 60¢10%

Alumund Grinding Machines, each, Nos. 01, \$1.75; 1A, \$2.50; 10, \$5.00

Alumund Sickle Grinders, each, Nos. 20, \$5.00; 20A, \$6.00; 20A, Combined, \$6.50... 30%

Alumund Disc Grinders, each, \$2.50... 30%

Grindstones—

Pike Mfg. Co.: 60¢10%

Improved Family Grindstones, # inch, # doz., \$2.00... 33½%

Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted... 40%

Grips, Nipple—

Perfect Nipple Grips... 40¢10¢2%

Halters and Ties—

Cow Ties... 65¢65¢10%

Bridgeport Chain Co.: 40%

Triumph Coil and Halters, 35¢2½¢40%

Brown Coil and Halters... 45¢50¢5%

Brown Cow Ties... 50¢50¢10¢5%

Brown Tie Outs... 70¢10¢75¢5%

Covert Mfg. Co.: 30¢2%

Jute Rope... 35%

Sisal Rope... 20%

Cotton Rope... 45%

Hemp Rope... 45%

Oneida Community:

Am. Coil and Halters... 40¢40¢5%

Am. Cow Ties... 45¢50%

Niagara Coil and Halters... 50¢50¢5%

Niagara Cow Ties... 45¢50¢50¢10¢5%

Hammers—

Handled Hammers—

Heller's Machinists... 35¢10¢55¢10¢5%

Heller's Farriers... 40¢50¢10¢10¢5%

Peck, Stow & Wilcox Co.: 40¢10¢50%

Crucible Steel... 40¢10¢50%

Farriers' Steel... 40¢10¢50%

Riveting... 40¢10¢50%

Machinists'... 66¢65%

Blacksmiths'... 50%

Fayette R. Plumb: 40¢2½¢40¢12½%

Eng. and B. S. Hand... 50¢10¢50¢60¢5%

Machinists' Hammers... 60¢10¢5%

Rivet and Tappers... 40¢7½¢40¢12½¢5%

Victor Magnetic Tack, # gro... \$7.75

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢... 80¢10%

3 to 5 lb., per lb., 40¢... 80¢10¢10%

Over 5 lb., per lb., 30¢... 80%

Over 5 lb., per lb., 30¢... 80¢10¢10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c... 60¢10¢60¢10¢5%

Hoe, Rake, &c... 40%

Fork, Shovel, Spade, &c... 40%

Long Handles... 40%

D Handles... 40%

Cross-Cut Saw Handles—

Atkins'... 40%

Champion... 50%

Disston's... 50%

Mechanics' Tool Handles—

Auger, assorted... gro. \$3.00@3.50

Brad Axl... gro. \$1.65@1.75

Chisel Handles, Ass'd, per gro.: Tanged Firmer, Apple, \$2.40@

\$2.65; Hickory... \$2.15@2.10

Socket Firming, Apple, \$1.75@

\$1.95; Hickory... 1.60@1.75

Socket Framing, Hickory, \$1.60@1.75

File, assorted... gro. \$1.30@1.40

Hammer, Hatchet, &c... 60¢10¢60¢10¢5%

Hand Saw, Varnished, doz., 80¢

85¢; Not Varnished... 65¢75¢

Plane Handles: Jack, doz., 30¢; Fore, doz... 45¢

Chapin-Stephens Co.: 30¢30¢10%

Chisel... 60¢60¢10%

File and Axl... 60¢60¢10%

Saw and Plane... 30¢30¢10%

Screw Driver... 30¢30¢10%

Millers Falls Adj. and Ratchet Auger Handles... 75¢10%

Nicholson Simplicity File Handle... # gro. \$0.85@1.50

J. L. Osgood: Indestructible File and Tool, # gro., No. 1, \$2.00; No. 2, \$2.50;

No. 3, \$3.00; No. 4, \$3.50; No. 5, \$4.00.

5, \$10.00... gro. lots 10%

W. A. Zelnicker Supply Co.:

Hammer, # doz., 12 in., \$2.00;

11 in., \$2.00; 16 in., \$2.30; 18

12, \$2.50; 20 in., \$2.70; 22 in.,

\$3.00; 24 in., \$3.30; 26 in., \$3.50;

30 in., \$3.80

Sledge, # doz., oval, 30 in.,

\$3.80; octagon, 30 in., \$3.80;

oval, 36 in., \$4.00; octagon,

36 in., \$4.00

Axe, # doz., 28 to 34 in., \$5.60;

36 in., \$5.80

Adze, # doz., 36 in., \$5.80; 36

in., \$7.80

Pick, # doz., R. R. 36 in.,

\$8.00; coal, 34 in., \$5.80.

Hatchet, # doz., 12 to 14 in.,

\$2.00

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Chicago Spring Butt Co.: 25%

Friction... 25%

Oscilating... 25%

Big Twin... 25%

Chisholm & Moore Mfg. Co.: 50%

Baggage Car Door

Hoes— Eye —
Scord and Oval Pattern.
 Grub, Hat Feb. 23, 1899.
 D. & H. Scovill.....
 Am. Fork & Hoe Co. (Scovill Pat-
 tern).....

Handled—
 Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50
 Star Double Bit.....
 American Fork & Hoe Co.:
 Regular, Cotton.....
 Crescent, Cultivator.....
 Mattock, Senior.....
 Mattock, Junior.....
 Sprouting.....
 Tobacco, Harper's.....
 Warren.....
 Ivanhoe.....
 Cultivator, B B 6.....
 Cultivator, B B 6 1/2.....
 Weeding, Acme.....
 Hoisting, Lightning.....

Hoisting Apparatus—
 See **Machines, Hoisting.**
Holders— Bit—
 Angular, 1/2 doz., \$21.00.....

Door—
 Bardeley's, Iron, 40%; Brass and
 Bronze.....
 Empire.....
 Pullman.....
 Richards Mfg. Co., No. 117, Ever-
 ready, 40%; Nos. 118, 119, Sure
 Grip.....
 Superior.....

File and Tool—
 Nicholson File Holders and File
 Handles.....

Fruit Jar—
 Triumph Fruit Jar Holder, 1/2 gross,
 \$18.00; 1 doz., \$2.00.....

Trace and Rein—
 Fernald Double Trace Holder, 1/2 doz.,
 pairs.....
 Dash Rein Holder, 1/2 doz.....

Hones—Razor—
 Pike Mfg. Co., Belgian and Swaty,
 50%; German.....

Hooks—Cast Iron—
 Bird Cage, Reading.....
 Clothes Line, Reading List.....
 Coat and Hat, Reading.....
 Coat and Hat, Wrightville.....
 Harness, Reading List.....

Wire—
 Belt, Nos. 1 to 15.....
 Wire O. & H. Hooks.....
 Bradley Metal Clasp Wire, Coat and
 Hat.....
 Columbian Hdw. Co., Gem.....
 Parker Wire Goods Co., King.....
 Wire Goods Co.:
 Acme, 60&10%; Chief, 70&10%;
 Crown, 75%; Czar, 65&10%;
 Brace, 75%; Czar Harness, 50%;
 Ceiling, 75%.

Wrought Iron—
 Box, 6 in., per doz., \$0.90; 8 in.,
 \$1.15.
 Cotton.....
 Wrought Staples, Hooks, etc.—
 See Wrought Goods.

Miscellaneous—
 Hooks, Bench, see **Stops, Bench.**
 Bush, Light, doz., \$6.20; Medium,
 \$6.75; Heavy, \$7.65
 Grass, best, all sizes, per doz.,
 \$2.75 to \$3.00
 Grass, common grades, all sizes
 per doz.....
 Whiffletree.....
 Hooks and Eyes:
 Brass.....
 Malleable Iron.....
 Covert Mfg. Co. Gate and Scuttle
 Hooks.....
 Turner & Stanton Co. Cup and
 Shoulder.....
 Bench Hooks—See Bench Stops.
 Corn Hooks—See Knives, Corn.

Horse Nails—
 See Nails, Horse.

Horseshoes—
 See Shoes, Horses.

Hose, Rubber—
 Garden Hose, 1/4-inch:
 Competition.....
 3-ply Guaranteed.....
 4-ply Guaranteed.....
 Cotton Garden, 1/4-in., coupled:
 Low Grade.....
 Fair Quality.....

Irons— Sad—
 From 4 to 10.....
 B. B. Sad Irons.....
 Mrs. Potts', cents per set:
 Nos. 50 55 60 65
 Jap'd Caps.....
 Tin'd Caps.....
 New England Pressing.....

Bar and Corner—
 Richards Mfg. Co., Bar, 60&10%;
 Corner.....

Pinking—
 Pinking Irons.....

Irons, Soldering
 See Coppers.

Jacks, Wagons—
 Covert Mfg. Co.:
 Auto Screw.....
 Lockport.....
 Lane's Steel.....
 Richards' Tiger Steel No. 130.....
 Smith & Hemenway Co.'s.....

Ladder—
 Richards Mfg. Co., Ladder Jacks.....

Jointers—
 Pike Mfg. Co., Saw Jointers, \$7.00. 40%

Kettles—
 Brass, Spun, Plain.....
 Enamelled and Cast Iron—See Ware,
 Hollow.

Knives—
Butcher, Kitchen, &c.—
 Foster Bros' Butcher, &c.....
 Wilkinson Shear & Cutlery Co.....

Corn—
 Columbian Cutlery Co., Wilcut
 Brand Knives and Hooks.....
 American Fork & Hoe Co.:
 Easy Cut, 1/2 doz., No. 10 B C H.....
 Aune, 1/2 doz.....
 Deut, 1/2 doz.....
 Adjustable, Serrated, 1/2 doz.....
 Serrated, 1/2 doz.....
 Yankee, No. 1 C H.....
 Yankee, No. 2 C H.....

Drawing—
 Standard List.....
 C. E. Jennings & Co., Nos. 45, 46,
 25&7 1/2%
 Jennings & Griffin, Nos. 41, 42,
 66&7 1/2%
 Swan's.....
 Watrous.....
 L. & I. J. White.....

Hay and Straw—
 Serrated Edge, per doz. \$5.00 to \$5.50
 Iwan's Pickle Edge.....
 Iwan's Serrated.....

Miscellaneous—
 Farriers'.....
 Wostenholm's.....

Knobs—
 Base, 2 1/2-inch, Birch or Maple,
 Rubber Tip.....
 Carriage, Jap., Drive, all sizes,
 gro. 35¢ to 40¢
 Door, Mineral.....
 Door, Por. Jap'd.....
 Door, Por. Nickel.....
 Bardeley's Wood Door, Shutters, &c. 15%

Lacing, Leather—
 See Belting, Leather

Ladders, Store, &c.—
 Lane's Store.....
 Myers' Noiseless Store Ladders.....
 Richards Mfg. Co.:
 Improved Noiseless, No. 112.....
 Climax Shelf, No. 113.....
 Trolley, No. 109.....

Ladies, Melting—
 L. & G. Mfg. Co., Melting and
 Plumbers'.....
 P. S. & W.....
 Reading.....

Lamps—
 Hammer's M. I. Hand.....

Lanterns—Tubular—
 Regular, No. 0.....
 Side Lift, No. 0.....
 Hinge Globe, No. 0.....
 Other Styles.....

Bull's Eye Police—
 3-inch.....

Latches— Thumb—
 Roggin's Latches, Jap'd, with
 Screws.....

Door—
 Cronk & Carrier Mfg. Co., No. 101,
 Richards' Bull Dog, Heavy, No. 123,
 Richards' Trump, No. 127.....

Leaders, Cattle—
 Small.....
 Covert Mfg. Co.:
 Cotton, 45%; Hemp, 45%; Jute,
 35%; Sisal, 20%.

Leathers, Pump—
 See Pumps—

Lifters, Transom—
 R. & E.....

Lines—
 Wire Clothes, Nos. 18 19 20
 100 feet.....
 75 feet.....
 Samsom Cordage Works:
 Solid Braided Chalk, Nos. 0 to 3.....
 Solid Braided Masons'.....
 Silver Lake Braided Chalk, No. 0,
 \$6.00; No. 1, \$6.50; No. 2, \$7.00; No.
 3, \$7.50.....
 Masons' Lines, Shade Cord, &c.:
 White Cotton, No. 3 1/2, \$1.50; No. 4,
 \$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/2,
 \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;
 Linen, No. 3 1/2, \$2.50; No. 4, \$3.50;
 No. 4 1/2, \$4.50.....
 Tent and Awning Lines: No. 5,
 White Cotton, \$7.50; Drab Cotton,
 \$8.50.....
 Clothes Lines, White Cotton: 50 ft.,
 \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75
 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75;
 100 ft., \$5.25.....
 Turner & Stanton Co.:
 Solid Braided Chalk, Masons' and
 Awning Lines.....
 Clothes Lines, White Cotton.....
 Shade Cord, Cotton or Linen.....

Locks— Cabinet—
 Cabinet Locks.....
Door Locks, Latches, &c.—
 NOTE—Net Prices are very often made
 on these goods.

Reading Hardware Co.....
R. & E. Mfg. Co.....

Padlocks—
 R. & E. Mfg. Co. Wrought Steel and
 Brass.....

Sash, &c.—

Ives' Patent:
 Crescent.....
 Automatic Gravity Metal Sash, 1/2
 gro. \$19.50.....
 Window Ventilating.....
 Pullman Patent Ventilating Lock.....
 Reading Sash Locks.....
 Taylor Mfg. Co., Perfect Ventilating,
 1/2 doz.....

Machines—Boring—

Com. Up'r't, without Augers,
 \$2.00 to \$2.25
 Com. Ang'r, without Augers,
 \$2.25 to \$2.50
 Ford Auger Bit Co.....
 Jennings, Nos. 1 and 4.....
 Millers' Falls.....
 Snell's, Upright, \$2.65; Angular, \$2.90
 Swan's Improved.....

Corking—
 Reisinger Invinible Hand Power.....
 1/2 doz., \$48.00

Fence—
 Williams' Fence Machines.....

Hoisting—
 Moore's Anti-Friction Chain Hoist.....
 Moore's Hand Hoist, with Lock.....
 Moore's Brake.....
 Moore's Cyclone High Speed Chain
 Hoist.....

Ice Cutting—
 Chandler's.....

Washing
 Boss Washing Machine Co.: Per doz.
 Boss No. 1.....
 Boss Rotary.....
 Champion Rotary Banner No. 1.....
 Standard Square No. 1.....
 Standard Perfection.....
 Cincinnati Sham Western.....
 Uneda American, Round.....

Mallets—
 Hickory.....
 Lignumvite.....
 Tinnars' Hickory and Apple-
 wood.....

Mangers, Stable—
 Swett Iron Works.....

Mats, Door—
 Acme Flexible Steel.....
 Elastic Steel (W. G. Co.), new list.....

Mattocks—
 See Picks and Mattocks.

Milk Cans—See Cans, Milk.

Mills, Coffee, &c.—
 Enterprise Mfg. Co.:
 Coffee.....
 Shell and Corn.....
 National list Jan. 1, 1902.....
 Parker's Columbia and Victoria.....
 Parker's Box and Side.....
 Swift, Lane Bros. Co.....

Motors, Water—
 Divine's Red Devil.....
 \$2.50 3.50 10.00 15.00.....
 No. 1 2 3 4

Lippincott's:
 No.....
 \$2.50 3.50 10.00 15.00.....
 Pike Mfg. Co., Tool and Knife
 Grinding.....

Mowers, Lawn—
 NOTE—Net prices are generally quoted
 Cheapest, 10-in., \$2.00; advance
 10¢ for each size.

Cheap, 10-in., \$2.25; advance 15¢
 20¢ for each size.
 Better Grade, 10-in., \$3.00; ad-
 vance 25¢ for each size.

High Grade.....
 Continental.....
 Great American.....
 Quaker City.....
 Pennsylvania.....
 Pennsylvania, Jr., Ball Bearing.....
 Pennsylvania Golf.....
 Pennsylvania Horse.....
 Pennsylvania Pony.....

Nails—
 Wire Nails and Brads, Miscel-
 laneous.....
 Cut and Wire. See Trade Report.
 Hungarian, Finishing, Upholster-
 ers', &c. See Tacks.

Horse—
 Nos. 6 7 8 9 10
 Anchor.....
 Coleman.....
 New Haven.....
 Livingston.....
 Western.....
 Jobbers' Special Brands,
 per lb. 9¢

Picture—
 1 1/2 2 2 1/2 3 in.
 Brass Hd. gro. 45 55 60 70
 Por. Head, gro. 1.10 1.10 1.10

Upholsters—
 Brass.....
 Plated.....

Nippers—
 See Pliers and Nippers.

Nipples—
 Standard Nipple Co.:
 Wrought Pipe Nipples.....

Nuts— Blank or Tapped.
 Cold Punched: Off Hat.
 Square.....
 Hexagon.....
 Square, C. T. & R.....
 Hexagon, C. T. & R.....

Hot Pressed:

Square.....
 Hexagon.....

Oakum—

Best.....
 U. S. Navy.....
 Navy.....
 Plumbers' Spun Oakum.....

Oil—

Pike Mfg. Co., Stonoil.....
Oil Tanks—See Tanks, Oil.

Oilers—

Steel, Copper Plated.....
 Chase or Paragon:
 Brass and Copper.....
 Zinc.....
 Railroad.....
 Malleable, Hammers' Improved, Nos.
 11, 12 and 13, 10%; Old Pattern,
 Nos. 1, 2, 3, 4, 50%
 American Tube & Stamping Co.:
 Spring Bottom Cans.....
 Railroad Oilers, &c.....
 Maple City Mfg. Co.:
 Spring Bottom Cans.....
 Railroad Oilers, &c.....

Openers—Packing Box—
 Herculever, 1/2 doz., \$24.....

Can Openers—
 Per doz.

Sprague, Iron Handle.....
 Sprague, Wood Handle.....
 Sardinia Scissors.....
 Can and Bottle Openers, 1/2 doz.,
 net: Yankee, \$0.75 to \$0.85; Little
 Gem, \$0.50 to \$0.65; Nifty.....

Egg—

Hartigan Nickel Plate, 1/2 doz., \$2.00;
 Silver Plate, \$4.00.

Packing—

Asbestos Packing, Wick and
 Rope, any quantity.....

Rubber—
 (Fair quality goods.)

Sheet, C. 1.....
 Sheet, C. O. S.....
 Sheet, C. B. S.....
 Sheet, Pure Gum.....
 Sheet, Red.....
 Jenkins' '96, 1/2 lb., 80¢.....

Miscellaneous—
 American Packing.....
 Cotton Packing.....
 Italian Packing.....
 Jute.....
 Russia Packing.....

Pails, Water, Well, &c.—
 See Buckets.

Paint—

Dixon's Silica-Graphite, in 1 gal.
 pails and 5 gal. kegs, 25%; pack-
 ages of larger size.....

Pans— Dripping—
 Standard List.....
 Edwards, Royal Blue.....

Fry—
 Common Lipped:
 Nos.....
 Per doz.....

Refrigerator, Galva—
 Inch.....
 Per doz.....

Paper—Building Paper
 Asbestos: 1b.
 Roll Board or Building Felt,
 6 to 30 lb., per 100 sq. ft.....
 Roll Board or Building Felt,
 3-32 and 1/2 in., 45 to 60 lb.,
 per 100 sq. ft.....
 Mill Board, Sheet, 40 x 40 in.,
 1-32 to 1/2 in.....

Per roll.
 Rosin Sized Sheathing: 500 sq. ft.
 Light weight, 25 lbs. to roll.....
 Medium weight, 30 lbs. to roll.....
 Heavy weight, 40 lbs. to roll.....

Black Water Proof Sheathing,
 500 sq. ft., 1 ply, 65¢; 2 ply,
 85¢; 3 ply, \$1.10; 4 ply, \$1.25.
 Deafening Felt, 9, 6 and 4 1/2 sq.
 ft. to lb., ton.....
 Red Rope Roofing, 250 sq. ft.
 per roll.....

Tarred Paper—
 1 ply (roll 400 sq. ft.), ton.
 2 ply, roll 108 sq. ft.....
 3 ply, roll 108 sq. ft.....
 Slater's Felt (roll 500 sq. ft.).....

Sand Paper and Cloth—
 Flint and Emery.....
 Garnet Paper and Cloth.....

Parers—Apple—
 Goodell Co.:
 Family Bay State.....
 Improved Bay State.....
 New Lightning.....
 Turn Table '98.....
 White Mountain.....
 Bonanza Improved.....
 Dandy.....
 Eureka Improved.....
 New Century.....
 Ranger.....

Livingston Nail Co.:	
Daisy	doz. \$4.00
Little Star	doz. \$5.00
Rocking Table	doz. \$6.20
Reading Hardware Co.:	
Advance	doz. \$4.00
Baldwin	doz. \$4.00
Reading 72	doz. \$3.25
Reading 78	doz. \$3.25

Orange—

Goodell Co., Success.	each \$30.00
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Potato—

Saratoga	doz. \$7.00
White Mountain	doz. \$6.00

Picks and Mattocks—

(List Jan., 1908.)

List	70¢100¢70¢10¢10%
Cronk's Handled Garden Mattock	doz. \$3.00

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass	50¢50¢10%
Iron, List Nov. 11, '85	60¢60¢10%

Pipe, Cast Iron Soil—

Standard, 2-6 in.	70¢10%
Extra Heavy, 2-6 in.	75¢10¢80%
Fittings, Standard and Heavy,	80¢10¢85%

Pipe, Merchant—

Consumers, Carloads,			
Steel. Blk. Galv. Blk. Galv.			
	%	%	%
1/4 and 1/2 in.	66	50	61
3/4 in.	68	54	68
1 in.	70	58	68
1 1/2 to 6 in.	74	64	72
7 to 12 in.	71	56	69

Pipe, Vitrified Sewer—

Carload lots.			
Standard Pipe and Fittings, 3			
to 24 in., f.o.b. factory:			
First-class	87%		
Second-class	90%		

Pipe, Stove—

Per 100 joints.			
Edwards' Nested:			
C. L. L. C. L.			
5 in., Standard Blue	\$6.25	\$7.25	
6 in., Standard Blue	6.75	7.75	
7 in., Standard Blue	7.75	8.75	
5 in., Royal Blue	7.50	8.00	
6 in., Royal Blue	7.50	8.50	
7 in., Royal Blue	8.50	9.50	
Wheeling Corrugating Co.'s Nested:			
5 in., Uniform Color	\$5.90	\$6.90	
6 in., Uniform Color	6.40	7.40	
7 in., Uniform Color	7.40	8.40	

Planes and Plane Irons—

Wood Planes—			
Bench, first qual.	30¢30¢10%		
Bench, second qual.	40¢40¢10%		
Molding	25¢25¢10%		
Chapin-Stephens Co.:			
Bench, First Quality	30%		
Bench, Second Quality	40%		
Molding and Miscellaneous	25%		
Toy and German	30%		
Union	60%		
Chapin's Iron Planes	60%		
Union	60%		

Plane Irons—

Wood Bench Plane Irons, List			
Dec. 12, '06.			
Buck Bros.	30%		
Chapin-Stephens Co.	25%		
Union	50%		
L. & I. J. White	20¢5¢25%		

Planters, Corn, Hand—

Kohler's Eclipse	doz. \$7.50
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Plates—

Fellow	lb. 3/4¢4¢
Avery Stamping Co.:	
Standard Wrot. Steel Fellow Plates	in 100 lb. kegs, per 100 lb. 3/4-in. to 1 1/4-in. \$4.00 net; 1 1/4-in. to 2-in., inclusive, \$3.75 net.

Steel Pipe Hook—

Never-Break	75¢10%
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Pliers and Nippers -

Button Pliers	75¢5¢75¢10¢5%
Gas Burners, per doz., 5 in.	\$1.25
Gas pipe, 7 in.	\$1.15, \$1.50.
Gas pipe, 8 in.	\$2.00
Gas pipe, 10 in.	\$2.25
Gas pipe, 12 in.	\$2.75

Acme Nippers	50¢5%
Cronk & Carrier Mfg. Co.:	
American Button	60%
Improved Button	75¢10%
Cronk's	60%
No. 80 Linemen's	50%
Stub's Pattern	45%
Combination and others	33 1/2%
Heller's Farriers' Nippers, Pincers	and Tools
P. S. & W. Tinner's Cutting Nip-	pers
Swedish Side, End and Diagonal	Cutting Pliers
Utica Drop Forge & Tool Co.:	
Pliers and Nippers, all kinds	40%

Plumbs and Levels—

Chapin-Stephens Co.:	
Plumbs and Levels	30¢30¢10%
Chapin's Imp. Brass Cor.	40¢40¢10%
Pocket Levels	30¢30¢10%
Extension Sights	30¢30¢10%
Machinists' Levels	40¢40¢10%
Diston's Plum. and Levels	60¢10%
Diston's Pocket Levels	60¢10%
Stanley's Duler	35%
Woods' Extension	39 1/2%

Points, Glaziers'—

Bulk and 1-lb. papers	lb. 9¢
1/2-lb. papers	lb. 9 1/2¢
1/4-lb. papers	lb. 11¢

Police Goods—

Manufacturers' Lists	25¢25¢5%
Tower's	25%

Polish—Metal, Etc—

Ladd Co.:	
Putzade Liquid	doz. gro. 1/2 pts. \$12.00; 1 pts. \$20.00; 1 qts. \$40.00;
doz. 1/2 gals. \$6.35; 1 gals. \$12.00.	
Prestoline Liquid, No. 1 (1/2 pt.)	doz. \$3.00; No. 2 (1 q.) \$0.00-40%
Prestoline Paste	doz. \$0.40
George William Hoffman:	
U. S. Metal Polish Paste, 3 oz.	boxes, doz. 50¢; doz. gro. \$4.50;
1/2 lb boxes, doz. \$1.25; 1 lb	boxes, doz. \$2.25.
U. S. Liquid, 8 oz. cans, doz.	\$1.25.
Barkeepers' Friend Metal Polish	doz. \$1.75.

Stove—

Black Eagle Benzine Paste, 5 lb cans,	doz. 10¢
Black Eagle, Liquid, 1/2 pt. cans,	doz. 75¢
Black Jack Paste, 1/2 lb cans, doz.	\$9.00
Black Kid Paste, 5 lb cans, each,	\$0.65
Ladd's Black Beauty Liquid, per	100 tins. \$6.75
Joseph Dixon, gr. \$5.75	10%
Dixon's Plumbago	doz. \$2.50
Pireside	gr. \$2.50
Gem, gr. \$1.50	10%
Japanese	gr. \$3.50
Jet Black	gr. \$3.50
Peerless Iron Enamel, 10 oz. cans,	doz. \$1.50

Window Polish—

Benj. P. Forbes:	
Glasbrite, No. 2, gal pails, doz.	\$3.00; each, \$2.50; 1 lb cans,
each	\$0.75
Glasbrite Powder, bbls., doz.	\$2.25

Poppers, Corn—

1 qt. Square	doz. \$0.80; gro. \$8.75
1 qt. Round	doz. \$0.90; gro. \$10.00
1 1/2 qt. Square	doz. \$1.20; gro. \$12.00
2 qt. Square	doz. \$1.50; gro. \$15.00

Post Hole and Tree Au-

gers and Diggers—	
See also Diggers, Post Hole, &c.	
Posts, Steel—	
Steel Fence Posts, each, 6 ft., 46¢;	
6 1/2 ft., 48¢; 7 ft., 50¢.	
Steel Hitching Posts	each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enamelled	40%
Tinned	30¢10%

Powder—

In Canisters:	
Duck, 1 lb.	each 45¢
Fine Sporting, 1 lb.	each 75¢
Rifle, 1/2 lb.	each 16¢
Rifle, 1 lb.	each 25¢
In Kegs:	
25-lb. kegs	\$3.50
King's Semi-Smokeless:	
Keg (25 lb bulk)	\$6.50
Half Keg (12 1/2 lb bulk)	\$3.50
Quarter Keg (6 1/4 lb bulk)	\$1.90
Case 24 (1 lb cans bulk)	\$6.50
Half case (1 lb cans bulk)	\$4.50
King's Smokeless: Shot Gun, Rifle,	
Keg (25 lb bulk)	\$12.00 \$15.00
Half Keg (12 1/2 lb bulk)	6.25 7.75
Quarter Keg (6 1/4 lb bulk)	3.25 4.00
Case 24 (1 lb cans bulk)	14.00 17.00
Half case 12 (1 lb c. bk.)	7.25 8.75

Presses—

Fruit, Wine and Jelly—	
Enterprise Mfg. Co.	20¢25%

Seal Presses—

Morrill's No. 1	doz. \$20.00
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Pruning Hooks and Shears

See Shears.	
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Pullers, Nail, Etc.—

Cyclops	50%
Miller's Falls, No. 3	doz. \$12.00.
Morrill's No. 1, Nail Puller	doz. \$20.00
Pearson No. 1, Cyclone Spike Puller,	each \$30.00
The Scranton Co. Case Lots:	
No. 2B (large)	\$5.50
No. 3B (small)	\$5.00
Smith & Hemenway Co.:	
Diamond B.	70%
Giant Pullers, Utica and	50%
Staple Pullers, Utica and	60%
Taylor Mfg. Co., Sampson Tack,	doz. \$4.00

Pulleys, Single Wheel—

Inch	1 1/2 2 3
doz.	\$0.50 \$1.50 \$1.00
Hay Fork, Sidel or Solid Eye,	doz., 1/2 in., \$1.25; 5 in., \$1.55
Inch	1 1/2 2 3
Hot House, doz.	\$0.65 \$1.20
Inch	1 1/2 2 3
Screw, doz.	\$0.16 \$0.23 \$0.30
Inch	1 1/2 2 3
Side, doz.	\$0.25 \$0.40 \$0.60
Inch	1 1/2 2 3

Sash Pulleys—

Common Frame; Square or	
Round End, per doz., 1 1/2 and	2 in.

Auger Mortise, no Face Plate,

per doz., 1 1/2 and 2 in.	20¢21¢
Acme, No. 35, 1 1/2 in., 19¢; 2 in., 20 1/2¢	
American Pulley Co.:	
Wrought Steel American Plain	doz. 50¢10%
Axle	doz. 50¢10%
Wrought Steel Eagle	doz. 17¢20¢
Top Notch, Electrically Welded,	No. 3 and 4, doz. 19¢
Common Sense	doz. 20¢
Fox-All-Steel, Nos. 3 and 7, 2 in.	doz. 50%
Grand Rapids All Steel Noiseless	doz. 50%
Niagara, No. 25, 1 1/2 in., 19¢; 2	in., 20 1/2¢
No. 26 Troy, 1 1/2 in., 19 1/4¢; 2 in., 16 1/2¢	
Star, No. 26, 1 1/2 in., 19 1/4¢; 2 in., 20 1/2¢	
Tackle Blocks—See Blocks.	

Pumps—

Cistern	75¢5¢75¢10%
Pitcher Spout	doz. 50¢
Wood Pumps, Tubing, &c.	doz. 50%
Barnes Dbl. Acting (low list)	doz. 80%
Barnes Pitcher Spout	doz. 80%
Contractors' Rubber Diaphragm, No.	2, B. & L. Block Co.
Daisy Spray Pump	doz. \$6.50
Flint & Walling's Fast Mail Hand	(low list)
Flint & Walling's Fast Mail (low	list)
Flint & Walling's Tight	Pitcher
National Specialty Mfg. Co., Measur-	ing Pumps, 2, \$6.00; 3, \$5.50
Myers' Nos. (low list)	doz. 30%
Myers' Power Pumps	doz. 30%
Myers' Spray Pumps	doz. 30%

Pump Leathers—

Plunger and Valve Leathers—Per	gro.:
No.	1 2 3 4
\$5.00 6.00 7.00 8.00	
Cup Leathers—Per 100:	
Inch.	2 1/2 3 3 1/2 4
\$5.00 7.00 9.00 12.00	

Punches—

Saddlers' or Drive, good,	doz. 50¢75¢
Spring, single tube, good qual-	ity
Revolving (4 tubes)	doz. \$3.50
Bemis & Call Co.'s Cast Stl Drive	50%
Morrill's Nos. 1AA, 1A, 1B, 1C,	1D, \$15.00
Hercules, 1 die, each \$5.00	50%
Niagara Hollow Punches	doz. 40%
Niagara Solid Punches	doz. 55¢10%
Tinner's Hollow, P. S. & W. Co.	40%
Tinner's Solid, P. S. & W. Co.,	doz. \$1.44

Rail—Barn Door, &c.—

Sliding Door, Painted Iron,	2 1/2¢2 1/2¢
Sliding Door, Wrought Brass,	1 1/2 in., lb., 36¢
Cronk's:	
Double Braced Steel Rail	ft. 2 1/2¢
O. N. T. Rail	2 1/2¢
Griffin's:	
xxx, 100 ft., 1 x 3-16 in., \$3.25;	
1 1/4 x 3-16 in., \$3.75.	
Hinged Hanger, 100 ft., 1 x 3-16	in., \$3.50; 1 1/4 x 3-16 in., \$4.00.
Lane's:	
Hinged Track, 100 ft.	\$3.45
O. N. T., 100 ft., 1 in., \$3.12 1/2;	
1 1/4 in., \$3.45; 1 1/2 in., \$4.00.	
Standard, 1 1/2 in., 100 ft. \$4.00	
Lawrence Bros.:	
1 x 3-16 in., 100 ft., \$7.50; 1 1/4	x 3-16 in., \$8.75
Trolley, No. 301, ft.	\$9.00
McKinney's:	
Hinged Hanger Track, ft., 1 1/4,	60¢45¢
1 x 3-16 Track	55¢74¢
Myers' Stayon Track	60¢5%
Richards Mfg. Co.:	
Common, 1 x 3-16 in., \$3.00; 1 1/4	x 3-16, \$3.25; 1 1/2 x 3-16, \$3.50
Special Hinged Hanger Rail	60¢10%
Lag Screw Rail, No. 65	50%
Gauge Trolley Track, ft. No. 31,	9¢; No. 32, 14¢; No. 33, 20¢.
No. 50	60¢10%
Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,	\$4.00; 45, \$3.25; 46, \$3.50; 47, No. 1,
\$3.25; 49, No. 2, \$3.50.	

Rakes—

NOTE—Many goods are sold at net prices.

American Fork & Hoe Co.:	
Lawn, doz., No. 24, \$2.50; No.	20
Cronk's:	
Steel Garden: Champion, doz. doz.,	12-tooth, \$3.75; 14-tooth, \$4.00; 16-
tooth, \$4.25; Ideal, doz. doz., 12-	tooth, \$3.00; 14-tooth, \$3.30; 16-
tooth, \$3.60.	
Victor, 12-tooth, \$2.25; 14-tooth,	\$2.50; 16-tooth, \$2.75.
Queen City Lawn, doz. doz., 20 teeth,	\$2.85; 24, \$3.00
Anticlog Lawn, doz. doz., \$4.00	
Malleable Garden	70¢10%
Ideal Steel Garden, doz. doz., 12 teeth,	\$15.00; 14, \$16.00; 16, \$18.00
Kohler's:	
Jumbo Lawn, 36-tooth	doz. \$5.00
Lawn Queen, 20-tooth	doz. \$2.85
Lawn Queen, 24-tooth	doz. \$3.00
Paragon, 20-tooth	doz. \$2.65
Paragon, 24-tooth	doz. \$2.75
Steel Garden, 14-tooth	doz. \$2.40
Malleable Garden, 14-tooth	doz. \$1.75

Rasps, Horse—

Diston's	75%
Heller Bros.	70¢40¢10%
Liveright Bros. Gold Medal	70¢10%
McCaffrey's American Standard	60¢10¢5%
New Nicholson	70¢10¢75%
See also Files.	

Razors—

John Engstrom Swedish	65%
Sharp Shaver	60%
Fox Razors, doz., No. 42,	\$24.00; No. 44, \$20.00; No. 82,
Platina, \$36.00.	

Reels, Fishing—

Hendryx:	
M 6, Q 6, A 6, B 6, M 9 1/4, M 16,	
Populo, Nickeled Populo, Rubber	20
Aluminum, German Silr., Bronze,	25
1240 N, 124 N	20
3004 N, 06 N, 6 RM, G 9	25
4 N, 6 PN, 24 N, 6 PN	20
2804 N, 33 1/2, 02084 PN,	33 1/2
0924 N, 33 1/2, 02084 PN,	33 1/2
020904 PN, 33 1/2, 802 N, 33 1/2	33 1/2
986 PN, 2904 N, 971 PN	25
5009 PN, 5009 N	20
Competitor, 102 P, 102 PN, 202 P,	20
202 PN, 102 PR, 102 PR	20
802 PN, 802 PN	20

Sausage Stuffers or Fillers—
See Stuffers or Fillers, Sausage.**Saw Frames—**
See Frames, Saw.**Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Saws—**

Atkins' Circular	45%
Band	50@50&10%
Butcher Saws	50%
Cross Cuts	45%
One-Man Cross Cut	45%
Narrow Cross Cut	50%
Hand, Rip and Panel	35&5%
Miter Box and Compass	40%
Mulay, Mill and Drag	45%
Wood Saws	40&10%
Chapin-Stephens Co.	30@30&10%
Diamond Saw & Stamping Works	30&10&10%
Sterling Kitchen Saws	30&10&10%
Diaston's:	
Circular, Solid and Ins'ted Tooth	50%
Band, 2 to 18 in. wide	60%
Band, 3 to 14	60%
Crosscuts	50%
Narrow Crosscuts	50%
Mulay, Mill and Drag	50%
Framed Woodsaws	25%
Woodsaw Blades	25%
Woodsaw Rode, Tinned	15%
Hand Saws, Nos. 12, 99, 9, 16, d100	25%
D8, 120, 76, 77, 8	25%
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1	30%
0, 80, Combination	30%
Compass, Key Hole, &c.	25%
Butcher Saws and Blades	30%
C. E. Jennings & Co.'s:	
Back Saws	16%
Butcher Saws	25&7 1/2%
Compass and Key Hole Saws	25&7 1/2%
Framed Wood Saws	33 1/2&7 1/2%
Hand Saws	12 1/2%
Wood Saw Blades	33 1/2&7 1/2%
Millers Falls:	
Butcher Saws	15&10%
Star Saw Blades	15&10%
Massachusetts Saw Works:	
Victor Kitchen Saws	40&10&50%
Butcher Saws Blades	35&40%
Peace & Richardson's Hand Saws	30%
Simonds':	
Circular Saws	45%
Crescent Ground Cross Cut Saws	30%
One-Man Cross Cuts	40&10%
Gang Mill, Mulay and Drag Saws	45%
Band Saws	50%
Back Saws	25&25&7 1/2%
Butcher Saws	35&35&7 1/2%
Hand Saws	25&25&7 1/2%
Hand Saws, Bay State Brand	45%
Compass, Key Hole, &c.	25&25&7 1/2%
Wood Saws	40&7 1/2%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws	50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A	25%
Diaston's:	
Concave Blades	25%
Keystone Blades	25%
Hack Saw Frames	30%
Simonds', 25%; The Best, 35%	
Culley	35%
C. E. Jennings & Co.:	
Hack Saw Frames, Nos. 175, 180	40&7 1/2%
Hack Saws, Nos. 175, 180, complete	40&7 1/2%
Goodell's Hack Saw Blades	40&7 1/2%
Griffin's Hack Saw Frames	35&5&10%
Griffin's Hack Saw Blades	35&5&10%
Star Hack Saws and Blades	15&10%
Sterling Hack Saw Blades	30&10&5%
Sterling Hack Saw Frames	30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00	10%
Victor Hack Saw Frames	20%
Whitaker Mfg. Co.:	
National Hand Blades, Hand Frames, Power Blades	40%

Scroll—

Barnes, No. 7, \$15	25%
Barnes' Scroll Saw Blades	40%
Barnes' Velocipede Power Scroll Saw, without boring attachment	\$18
with boring attachment, \$20	20%
Lester, complete, \$10.00	15&10%
Rogers, complete, \$3.50 and \$4.00	15&10%

Scales—

Union Platform, Platn \$2.10 @ 2.20	
Union Platform, Stpd. \$2.20 @ 2.30	
Chatillon's:	
Eureka	25%
Favorite	50%
Grocers' Trip Scales	40%
The Standard Portable	40%
The Standard R. R. and Wag-	
on	50&10%

Scrapers—

Box, 1 Handle	doz. \$1.85 @ 2.10
Box, 2 Handle	doz. \$2.35 @ 2.50
Ship, Light, \$2.00; Heavy, \$2.50	
Chapin-Stephens Co., Box, 30&30&10%	
Richards Mfg. Co., Foot	60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., \$2.50 @ 2.75; 1 1/2, \$3.00 @ 3.25; 1 3/4, \$3.50 @ 3.75	
Bench, Wood	20 @ 20&10%
Hand, Wood	70 @ 70&10&10%
Chapin-Stephens Co., Hand	70 @ 70&10&2 1/2%

Coach, Lag and Hand Rail—	
Log, Cone Point, 80&10 @ 80&10&5%	
Coach, Gimlet Point, 80 @ 80&10%	
Hand Rail	70 @ 70&10%

Jack Screws—

Standard List	70 @ 70&10&7 1/2%
Millers Falls	50&10&10%
Swett Iron Works	70 @ 70%

Machine—

Cut Tread, Iron, Brass or Bronze:

Flat Head or Round Head	50 @ 50&10%
Fullister Head	40 @ 40&10%
Rolled Thread, F. H. or R. H.	75&10%
Iron	75&10%
F. H. or R. H., Brass, Nos. 8 to 14	65&10%

Set and Cap—

Set (Iron)	75&10&7 1/2%
Set (Steel), net advance over	
Iron	25%
Sq. Hd. Cap	70 @ 70&10&7 1/2%
Hex. Hd. Cap	70 @ 70&10&7 1/2%
Rd. Hd. Cap	60 @ 60&7 1/2%
Fullister Hd. Cap	60 @ 60&7 1/2%

Wood—

List July 23, 1908.	
Flat Head, Iron	87 1/2 @ 87 1/2%
Round Head, Iron	85 @ 85&10%
Flat Head, Brass	80 @ 80&5%
Round Head, Brass	77 1/2 @ 77 1/2%
Flat Head, Bronze	75 @ 75&5%
Round Head, Bronze	72 1/2 @ 72 1/2%
Drive Screws	87 1/2 @ 87 1/2%

Scroll Saws—

See Saws, Scroll.

Scythes—

Per Cos.

Plain Grass, Cutting Edge Polished	\$6.25 @ \$6.50
Clipper, Bronzed Web, \$6.50 @ \$6.75	
Solid Steel, Web and Backs Polished	\$7.00 @ \$7.25
Bush, Weed and Bramble, Painted	\$6.50 @ \$6.75
Grain, Painted, Cutting Edge Polished	\$8.25 @ \$8.50
Clipper Grain, Bronze Web	\$8.50 @ \$8.75

Seeders, Raisin—

Enterprise	25 @ 30%
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Sets—Awl and Tool—

Fray's Tool Handles, Nos. 1, \$12; 2, \$16; 3, \$12	30%
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18	30&10%

Garden Tool Sets—

American Fork & Hoe Co.:	
Rake, Shovel and Hoe, 1/2 doz, sets, No. 3 P	\$7.25

Sets, Nail—

Octagon	gro. \$3.50 @ 3.75
Buck Bros.	25 @ 30%
Mayhew's	1/2 doz. \$9.00
Snell's Corrugated, Cup Pt.	40&10%
Snell's Knurled, Cup Pt.	40&10%
Victor Knurled, Cup Pt.	1/2 doz. \$7.50

Rivet—

Regular list	75 @ 75&10%
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Saw—

Atkin's:	
Criterion	40%
Adjustable	40%
Diaston's Star, Monarch and Triumph	30%
Morrill's No. 1	25 @ 30%
Nos. 3 and 4, Cross Cut	\$20.00
No. 5, Mill	\$30.00
No. 11, 95	\$15.00
No. 1 Old Style	\$10.00
Special	\$16.25
Giant Royal Cross Cut	1/2 doz. \$7.50
Royal, Hand	1/2 doz. \$4.50
Taintor Positive	1/2 doz. \$6.75

Shaving—

Fox Shaving Sets, No. 30	
1/2 doz, net, \$24.00	
Smith & Hemenway Co.'s	75%

Sharpeners, Knife—

Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones	1/2 doz. \$1.50
Mounted Kitchen Sand Stone	1/2 doz. \$1.50
Natural Grit Carving Knife Hones	1/2 doz. \$3.00
Quick Cut Emery Carving Knife Hones	1/2 doz. \$1.50
Quick Edge Pocket Knife Hones	1/2 doz. \$2.50

Skate—

Smith & Hemenway Co., Eureka	50%
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Shaves, Spoke—

Iron	doz. \$1.25
Wood	doz. \$2.00
Bailey's (Stanley R. & L. Co.)	45%
Chapin-Stephens Co.	30 @ 30&10%
Goodell's	1/2 doz. \$9.00

Shears—

Cast Iron, 7 8 9 in.	
Best	\$6.00 18.00 20.00 gro.
Good	\$13.00 15.00 17.00 gro.
Cheap	\$5.00 6.00 7.00 gro.

Straight Trimmers, &c.	
Best quality Jap.	70 @ 70&5%
Best quality Nickel	60 @ 60&5%

Tailors' Shears	40 @ 40&10%
Acme Cast Shears	10 @ 40&5%
Heinrich's Tailors' Shears	10%
National Cutlery Co.'s Nickel Plated	60&10%
60&10%; Japan Handles	70&10%
Columbian Cutlery Co.:	
Sheep, 1900 list	30&10&5%
Grass	50&10%
Horse or Mule	50&10%
J. Wiss & Sons Co.:	
Best Quality Jap'd	60&10%
Best Quality Nickle	50&10%
Tailors'	25%

Snips—

Steel Blades	20 @ 20&10&10%
Steel Laid Blades	30 @ 30&10%

Tinners' Snips—

Steel Blades	20 @ 20&10&10%
Steel Laid Blades	30 @ 30&10%

Acme Cast Snips	40 @ 45&5%
Forced Handles, Steel Blades, Berlin	50%
Heinrich's Snips	10%
Jennings & Griffin Mfg. Co.'s 6 1/2 to 10 in.	33 1/2 @ 33 1/2%
National Cutlery Co.'s Forged Steel	60
Niagara Snips	40%
P. S. & W. Forged Handles	25%
W. R. W.	50%
J. Wiss & Sons Co.:	
Wiss Forged Steel	25%

Pruning Shears—

Cronk's Hand Shears	33 1/2%
Cronk's Wood Handle Shears	33 1/2%
Diaston's Combined Pruning Hook and Saw, 1/2 doz, \$18.00	25%
Diaston's Pruning Hook only, 1/2 doz, \$12.00	25%
J. T. Henry Mfg. Co.:	
Pruning Shears, all grades	40%
P. S. & W.	40&10%
Columbian Cutlery Co.:	
Hedge, Wilcut Brand	60&10%
Lawn and Border, Wilcut Brand	60&10%

Sheaves—Sliding Door—

Reading	40%
R. & E. list	15%

Sliding Shutter—

Reading list	40%
R. & E. list	15%

Shells—Shells, Empty—

Brass Shells, Empty:	
Climax, 10 and 12 gauge	60&5%
Club, Rival, 6&5%; First Quality	60&5%

Paper Shells, Empty:	
New Rapid, 10, 12, 16 and 20 gauge	25&10%

Climax, 10 and 12 gauge; Acme and Magic, 10, 12, 16 and 20 gauge; Ideal, 10, 12, 16 and 20 gauge	
Leader grade	25&5%
Union, League, 10 and 12 gauge	25%
Rival Grade	25%
New Climax, Deference, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge; League, Union, 14, 16 and 20 gauge; Repeater Grade	20%

Shells, Loaded—

Loaded with Black Powder	40%
Loaded with Smokeless Powder, medium grade	40&5%
Loaded with Smokeless Powder, high grade	40&10&10%

Union Metallic Cartridge Co.:	
New Club, Black Powders	40%
Nitro Club, Smokeless Powders	40&5%
Arrow, Smokeless Powders	40&10&10%

Winchester:	
Smokeless Repeater Grade	40&5%
Smokeless Repeater Grade	40&10&10%
Black Powder	40%

Shingles, Metal—Per Sq.

Edwards Mfg. Co.:	
Painted	
14 x 20	\$4.25
10 x 18	4.50
7 x 10	4.75
Galv.	
14 x 20	\$6.03
10 x 18	6.25
7 x 10	6.50

Wheeling Corrugating Co.:	
Dixie, 14 x 20 in.	\$4.05
Dixie, 10 x 14 in.	4.25
Dixie, 7 x 10 in.	5.25
5.45	
6.70	

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:	
Iron	per keg \$4.10
Steel	per keg \$3.85
Burden's, all sizes	1/2 keg \$3.90

Shot—

Drop, up to B	25-lb. bag. \$1.80
Drop, B and larger	2.05
Buck	2.05
Chilled	2.05
Dust	2.30

Shovels and Spades—

Association List, Nov. 15, 1902	40%
Avery Stamping Co.	40%

Snow Shovels—

Long Handle	\$2.50 @ \$2.75
Wood and Mail, D Handle	\$2.65 @ \$2.90

Sieves and Sifters—

Hunter's Imitation, gro.	\$9.50
Hunter's Genuine, per gro.	\$12.00

Sifters, Ash—

Acme Ball Bearing Sales Co., Acme Automatic Ash Sifter, each	\$3.25;
1/2 doz.	\$39.00

Sieves, Seamless Metallic

Mesh	14 16 18 20
Iron Wire	\$1.05 1.05 1.10 1.20
Tinned Wire	\$1.15 1.15 1.20 1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 inch	
Mesh 18, Nested	doz. \$9.90 @ 9.95
Mesh 20, Nested	doz. \$1.00 @ 1.05
Mesh 24, Nested	doz. \$1.30 @ 1.40

Sinks, Cast Iron—

Painted, Standard list:	
12 x 12 to 22 x 36 in.	60%
20 x 24 to 24 x 50 in.	50%
24 x 60 to 24 x 120 in.	30%
Barnes' low list	60%

NOTE—There is not entire uniformity in lists used by jobbers.	
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Skains, Wagon—

Cast Iron	70 @ 75&10%
Steel	40 @ 45%

Slates, School—

Factory Shipments	
"D" Slates	30 @ 30&10%

Eureka, Unexcelled Noiseless.. 60&7 tens.

Victor A, Noiseless. 60&4 tens & 5%.

Slaw Cutters—See Cutters.

Snaps, Harness—

German .. 40 @ 40&10%

Covert Mfg. Co.:

Derby, 25%; Yankee, 30&2%; Yankee Roller, 30&2%

Scythe Stones—	
Pike Mfg. Co., 1907 list:	
Black Diamond S. S.	gro. \$12.00
Lamolle S. S.	gro. \$11.00
White Mountain S. S. . . .	gro. \$9.50
Green Mountain S. S. . . .	gro. \$7.00
Extra Indian Pond S. S. . .	gro. \$8.00
No. 1 Indian Pond S. S. . .	gro. \$7.50
No. 2 Indian Pond S. S. . .	gro. \$6.00
Leader Red End S. S. . . .	gro. \$5.00
Quick Cut Emery	gro. \$10.00
Pure Corundum	gro. \$18.00
Crescent	\$7.00
Emery Scythe Rifles, 2 Coat.	\$8.00
Emery Scythe Rifles, 3 Coat.	\$11.00
Emery Scythe Rifles, 4 Coat.	\$13.20
Balance of 1907 list	33%
Lectro (Artificial)	\$12.00, 33%
Lightning (Artificial) . . .	gro. 33%
\$18.00	33%
Stoppers, Bottle—	
Victor Bottle Stoppers . . .	gro. \$9.00
Stops—Bench—	
Millers Falls	15-10%
Morrill's, 1/2 doz., No. 1 . .	\$10.00
Morrill's, No. 2, 1/2 doz. . .	50%
Door—	
Chapin-Stevens Co.	50-55-10%
Plane—	
Chapin-Stevens Co.	20%
Straps—Box—	
Acme Embossed, case lots .	20-10-10%
Cary's Universal, case lots .	20-10-10%
Stretchers, Carpet—	
Cast Iron, Steel Points . .	doz. 55¢
All Steel Socket	doz. \$2.00-2.25
Excelsior Stretcher and Tack	Hammer Combined, 1/2 doz., \$6.00-20%
Stuffers, Sausage—	
Enterprise Mfg. Co., Stuffers and	Lard Presses 25-25-7%
National Specialty Co., list Jan. 1,	1902 30-45%
P. S. & W. Co.	40-10-45%
Sweepers, Carpet—	
Bissell Carpet Sweeper Co.:	
Cyclo Bearing Superba . .	\$36.00
Triumph	\$33.00
Parlor Queen	\$30.00
Elite	\$29.00
Boudoir	\$27.00
American Queen	\$27.00
Ideal	\$25.00
Gold Medal	\$25.00
Primer	\$24.00
Prime	\$24.00
Wellcome	\$24.00
Grand Rapids	\$24.00
Nickel	\$24.00
Crystal	\$24.00
Parlor Grand	\$48.00
Club	\$54.00
Hall	\$60.00
Standard Japan	\$22.00
Crown Jewel	\$21.00
Crown Jewel, Japan	\$19.00
Junior, Japan	\$22.00
NOTE.—Rebates: 50¢ per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots.	
Tacks, Finishing Nails, &c.	
American Carpet Tacks . .	90-5-50-¢
American Cut Tacks	90-5-50-¢
Sredes' Cut Tacks	90-5-50-¢
Sredes' Upholsterers'	90-5-50-¢
Gimp Tacks	90-5-50-¢
Lace Tacks	90-5-50-¢
Trimmers' Tacks	90-5-50-¢
Looking Glass Tacks	65-0-0-¢
Bill Posters' and Railroad Tacks	90-5-50-¢
Hungarian Nails	80-0-0-¢
Finishing Nails	70-0-0-¢
Trunk and Clout Nails . . .	75-5-50-¢
NOTE.—The above prices are for Straight Weights.	
Miscellaneous—	
Double Pointed Tacks . .	90-5-50-¢
See also Nails, Wire.	
Tanks, Oil and Gasoline—	
Wilson & Friend Co.:	
Gal. Gasoline	Oil
30	\$2.75
60	\$3.00
120	\$3.50
150	\$5.75
Tapes, Measuring—	
American Asses' Skin	50-0-0-¢
Patent Leather	25-0-30-45-¢
Steel	33-1-45-¢
Chesterman's	25-0-25-45-¢
Keuffel & Esser Co.:	
Favorite, Ass Skin	40-10-50-¢
Favorite, Duck and Leather .	55-5-50-¢
Metallic and Steel, lower list, 35¢	55-5-50-¢
55-5-50-¢; Pocket, 35-5-50-¢.	
Lufkins' Asses' Skin	
Asses' Skin	40-10-50-¢
Metallic	30-30-45-¢
Patent Bend, Leather	55-5-50-¢
Pocket	40-10-45-¢
Steel	33-1-45-¢
Wiebisch & Hilger:	
Chesterman's Metallic, No. 34L	etc. 25%
Chesterman's Steel, No. 1033L	etc. 35%
Teeth, Harrow—	
Steel Harrow Teeth, plain or	headed, 1/2-inch and larger,
per 100 lb.	\$2.50-32.00
Thermometers—	
Tin Case, Cabinet, Flange,	Dairy, &c. 30-35%
Ties, Bale—Steel Wire—	
Single Loop	87-1-10%
Standard	70-1-10%
Monitor, Cross Head, &c. 70-1-10%	
Tinner's Shears, &c.—	
See Shears, Tinner's, &c.	

Tinware—	
Stamped, Japanned and Pieced, sold	very generally at net prices.
Tire Benders, Upsetters, &c.	
See Benders and Upsetters, Tire.	
Tools—Coopers'—	
L. & I. J. White	20-20-5%
Haying—	
Myers' Hay Tools	50%
Ice Tools—	
Gifford-Wood Co.	15%
Miniature—	
Smith & Hemenway Co.'s David-	son, 1/2 doz., Nickel Plated, \$1.50;
Gold Plated	\$2.00
Saw—	
Atkins' Cross Cut Saw Tools . .	35-5%
Simond's Improved	33%
Simond's Crescent	30%
Ship—	
L. & I. J. White	25%
Torches—	
Hammers, Engine, 1/2 doz. . . .	\$1.50
Transom Lifters—	
See Lifters, Transom.	
Traps—Fly—	
Balloon, Globe or Acme, doz.,	\$1.15-1.25; gro. \$11.50-12.00
Harper, Champion or Paragon,	doz., \$1.25-1.40; gro. \$13.00-13.50
Game—	
Imitation Oneida	75-10%
Newhouse	50-45%
Hawley & Norton	65-10%
Victor	75-75-10%
Oneida Community Jump . . .	70-45%
Stop Thief	60%
Tree Trap	60%
Hector	75-75-10%
Mouse and Rat—	
Mouse, Wood, Choker, doz. holes,	12¢
Mouse, Round or Square Wire,	doz. 85-90¢
Marty French Rat and Mouse Traps	(Genuine), 1/2 doz.:
No. 1, Rat	\$11.50
No. 2, Rat	\$5.75
No. 3, Rat	\$5.25
No. 4, Rat	\$5.25
No. 5, Mouse	\$2.25
Animal Trap Co.:	
Out o' Sight, Mouse, 1/2 doz. . .	\$0.60
Out o' Sight, Rat, 1/2 doz. . .	1.20
Easy Set, Mouse, 1/2 doz.35
Easy Set, Rat, 1/2 doz.85
Out o' Sight Chockers, 1/2 doz.	holes 12¢
Out o' Sight, Tin, 5-hole, 1/2 doz.	traps 75
Trowels—	
Disston Brick and Pointing . . .	25%
Disston Plastering	20%
Disston "Standard Brand" and Gar-	den Trowels 30%
Kohler's Steel Garden Trowels, 1/2	gro. \$1.50
5 in., \$1.50; 6 in., \$6.00.	
Never-Break Forged Steel Garden	Trowels, in bulk, net 1/2 doz. \$5.50
In 1 doz. boxes	gro. \$6.00
Woodrough & McParlin, Plastering	25%
Trucks, Warehouse, &c.—	
B. & L. Block Co.:	
New York Pattern	50-10%
Western Pattern	60-10%
Handy Trucks	1/2 doz. \$16.00
Grocery	1/2 doz. \$15.00
McKinney Trucks	each, net \$10.00
Model Store Trucks	1/2 doz. \$18.50
Tubs, Wash—	
M'fgr's list, price per gross.	
No. 0 1 2 3	
Galvanized	\$67 \$79 \$80 \$99 10-7 1/4
45-5%	
Twine, Miscellaneous—	
Flax Twine:	
No. 9, 1/4 and 1/2-lb. Balls . .	21-23¢
No. 12, 1/4 and 1/2-lb. Balls . .	19-21¢
No. 18, 1/4 and 1/2-lb. Balls . .	16-18¢
No. 24, 1/4 and 1/2-lb. Balls . .	15-17¢
No. 36, 1/4 and 1/2-lb. Balls . .	15-17¢
Chalk Line, Cotton	1/2-lb.
Balls	24-29¢
Cotton Mops, 6, 9, 12 and 15 lb.	to doz. 6-14-19¢
Cotton Wrapping, 5 Balls to lb.,	according to quality 13-14-19¢
American 2-Ply Hemp, 1/4 and	1/2-lb. Balls 12-16-18¢
American 3-Ply Hemp, 1-lb	Balls 13-16-16¢
India, 2-Ply Hemp, 1 1/2-lb. Balls	Balls (Spring Twine) 7-14-9¢
India 3-Ply Hemp, 1-lb. Balls	7-14-9¢
India 2-Ply Hemp, 1 1/2-lb. Balls	7-14-9¢
2, 3, 4 and 5-Ply Jute, 1 1/2-lb.	Balls 9-11¢
Mason Line, Linen, 1/2-lb. Bls.	7¢
No. 264 Mattress, 1/2 and 1/2 lb.	Balls, according to quality .
30-60¢	
Wool, 3 to 6 ply	B 6¢; A 7 1/2¢
Vises—	
Solid Box	50-45-50-10-45%
Parallel—	
Athol Machine Co.:	
Simpson's Adjustable	40%
Standard	40%
Amateur	25%
Columbian Hdw. Co.	40-55%
Slide	65%

Fisher & Norris Double Screw, net,	each, Nos. 2, \$10.50; 3, \$16.00; 4,
\$20.50; 5, \$27.00; 6, \$32.00.	
Fulton Mach. & Vise Co.:	
F. & R. Double Swivel Ma-	chinalists' 40%
Star, Solid Jaw, Machinists' . .	40%
Holland's	40-40-5%
Machinists'	40-40-5%
Keystone	65-5-70%
Lewis Tool Co.:	
Adjustable Jaw	30%
Monarch, 50%; Solid Jaw . . .	50%
Massey Vise Co.:	
Clincher	40%
Parallel Bar	15%
Perfect, 15%; Lightning Grip . .	15%
Merrill's	25%
Millers Falls Oval Slide Pattern .	60-10%
Parker's	20-25%
Victor, 20-25%; Regulars . . .	20-25%
Vulcan's	40-45%
Combination Pipe	55-60%
Prentiss	20-25%
Rock Island	33%
Snediker's & L.	33%
Stephens	33%
Saw Filers	
Disston's D 3 Clamp and Guide, 1/2	doz., \$24.00, 30%; Clamps . . .
Perfection Saw Clamps, 1/2 doz. .	\$4.50
Reading	60%
Wood Workers—	
Fulton Mach. & Vise Co.:	
F. & R. Double Swivel Coach-	man's 40%
Star Solid Jaw Woodworkers . .	60%
Massey Vise Co.:	
Lightning Grip, 15%; Perfect . .	15%
Wyman & Gordon's Quick Action, 6	in., \$6.00; 9 in., \$7.00; 14 in., \$8.00.
Miscellaneous—	
Fulton Machine & Vise Co., Com-	bination Pipe 70%
Holland's Combination Pipe . .	60-60-45%
Massey's Quick Action Pipe . .	40%
Parker's Combination Pipe:	
87 Series, 60%; 187 Series, 60-45%;	No. 870, 40%.
Rock Island Pipe	25%
Wads—Price per M.	
B. E., 11 up	60¢
B. E., 9 and 10	70¢
B. E., 8	80¢
B. E., 7	80¢
P. E., 11 up	\$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger . . .	\$1.70-1.75
Ely's P. E., 12 to 20	\$3.00-3.25
Ware, Hollow—	
Cast Iron, Hollow—	
Store Hollow Ware:	
Enameled	45-10%
Ground	50-45%
Plain or Unground	60%
Country Hollow Ware, per 100	lbs \$2.75-3.00
White Enameled Ware:	
Maslin Kettles	65-10%
Covered Wares:	
Tinned and Turned	35-10%
Enameled	45-10%
See also Pots, Glue.	
Enameled—	
Agate Nickel Steel Ware	33-4%
El-an-gue Ware	60-10%
Iron Clad Ware	70-10%
Lava and Volcanic Enameled .	40-10%
Tea Kettles—	
Galvanized Tea Kettles:	
Inch	6 7 8 9
Each	45¢ 50¢ 55¢ 65¢
Steel Hollow Ware—	
Avery Stamping Co.:	
Never-Break Spiders and Grid-	dles 65-10%
Steel Kettles, Maslin Scotch	Bowls, Tin'd 60%
Steel Stew Pans, Stew Pots, etc.	Forcelain 50%
Cleveland Stamping & Tool Co.:	
Solid Steel Spiders and Grid-	dles 65-5%
Solid Steel Kettles	60-45%
Warrners, Foot—	
Pike Mfg. Co., Soapstone . . .	40-40-10%
Washboards—	
No. 60—Brass King, Single Surface	1/2 doz. \$2.80
Open Back	\$2.80
902—White Hen, Spiral Grimp	Glass \$3.35
904—Royal Blue Enamel, Single	Surface, Ventilated Back . . .
172—Our Best, Single Zinc, Soap	Drainer \$3.35
722—Soap Saver, Single Zinc, Iron	Top \$3.35
100—Northern Queen, Single Zinc,	Perforated, Open Back . . .
134—Universal, Single Zinc, Extra	Family Size, Ventilated Back .
760—Banner Globe, Single Zinc, Ven-	tilated Back \$2.25
57—Peerless, Double Zinc, Spring	Protector \$3.70
52—Red Cross, Double Zinc, Swing	Protector \$3.60
17—North Star Solid Zinc, Swing	Protector \$3.60
737—Jewel, Single Zinc, Pair Size	\$1.25
Washers—Leather, Axle—	
Solid	90-90-10%
Patent	90-90-45%
Coll: 1/4 1 1 1/4 1 1/2 per doz.	
9 10 11 12 13 14 15 16 17 18	
Size bolt	5-10 1/2 3/4 1 1 1/4 1 1/2 2 3/4
Washers	\$1.90 1.00 2.70 2.50 2.30
The above prices are based on	\$6.50 off list.
In lots less than one keg add	1/4¢ per lb.; 5-lb. boxes add 1/4¢
to list.	

Avery Stamping Co.:	
Standard, in 200 lb kegs, \$6.00 1/2	
100 lb. disct.; in 100 lb kegs, add	10¢ net 1/2 100 lb; in 5 or 10 lb
boxes, add 50¢ net 1/2 100 lb;	in 1 lb boxes, add \$1.00 net 1/2
100 lb.	
Cast Washers—	
Over 1/2-inch, barrel lots,	per lb. 1 1/2¢-1 3/4¢
Wedges—	
Oil Finish	lb., 2 1/4¢-2 3/4¢
Weights—Hitching—	
Covert Mfg. Co.	30-22%
Sash—	
Per net ton, f.o.b. factory:	
Eastern District	\$20.00-40-—
Western and Central	Districts \$19.00-40-—
Wheels, Corundum and Emery—	
Pike Mfg. Co., Corundum, 65%;	Emery 75%
Well—	
8-in., \$2.00; 10-in., \$2.50; 12-in.,	\$3.00; 14-in., \$4.45.
Wire and Wire Goods—	
Bright and Annealed:	
6 to 9	72-10-7 1/2%
10 to 18	72-10-10 1/2%
19 to 26	75-10-10 1/2%
27 to 36	77-10-7 1/2%
Galvanized:	
6 to 9	72-10-10%
10 to 14	72-10-10 1/2%
15 to 16	72-10-10 1/2%
17 to 18	72-10%
19 to 26	70-10-10 1/2%
27 to 36	65-10-10 1/2%
Coppered:	
6 to 9	65-10-10 1/2%
10 to 14	70-10-10 1/2%
15 to 18	65-10-10 1/2%
19 to 26	70-10-10 1/2%
27 to 36	72-10-10 1/2%
Tinned:	

